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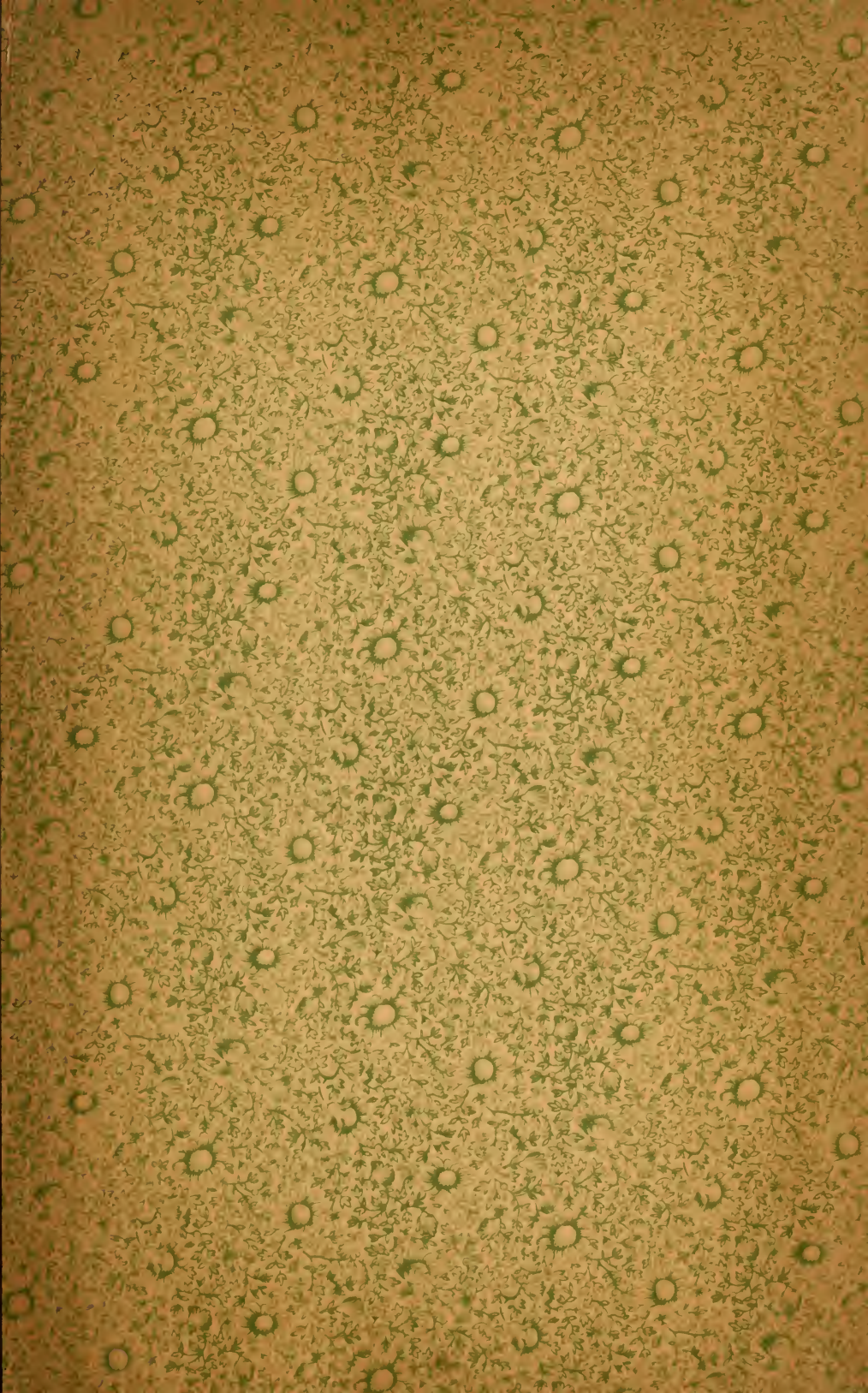
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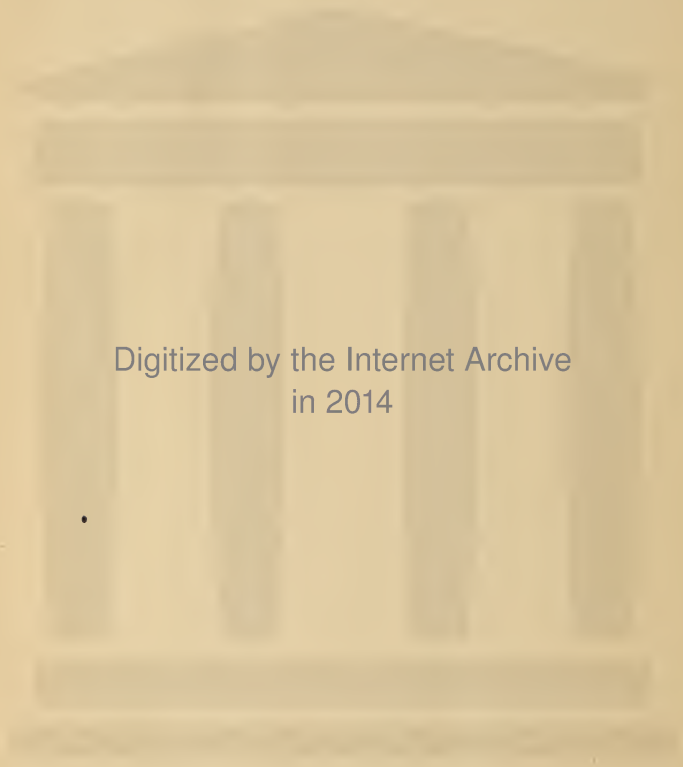
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THE JOURNAL

OF

THE ALLIED SOCIETIES

PUBLISHED QUARTERLY BY THE ALLIED SOCIETIES

SOCIETIES:

THE NEW YORK INSTITUTE OF
STOMATOLOGY

THE AMERICAN ACADEMY OF
DENTAL SCIENCE

THE HARVARD ODONTOLOGICAL
SOCIETY

THE METROPOLITAN DISTRICT OF
THE MASSACHUSETTS
DENTAL SOCIETY

THE BOSTON AND TUFTS DENTAL
ALUMNI ASSOCIATION
and the
MASSACHUSETTS DENTAL SOCIETY

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VOLUME IV

OFFICE OF PUBLICATION: 63 West 48th Street, NEW YORK CITY, N. Y.

Entered at the Post Office at New York City, N. Y., as second-class matter

Contents for Volume IV

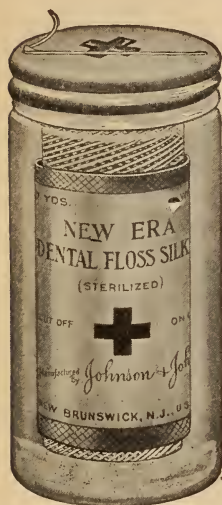
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136 Boylston Street,

Boston, Mass.

THE JOURNAL

OF

THE ALLIED SOCIETIES

VOL. IV.

MARCH, 1909.

No. 1

THE BOSTON CONFERENCE.

In his benediction to the Boston Conference on Oral and Dental Hygiene, which ended on the twenty-third day of January at Huntington Hall, President Elliot said, "There is coming a great change in the practice of medicine and surgery and dentistry, and a much greater proportion of the attention of these professions is hereafter to be devoted to prevention rather than cure."

Dental Hygiene is an important part of a broad, an universal movement for better care of the public health through a more complete knowledge of the conditions which promote health. The dentist must now take his active part and responsibility in the great progress for preventive medicine which is everywhere working. He must give to it his skill, his time, his money.

One of the best and surest marks of civilization is found in the attitude of its medical men—and the dentist belongs to the medical profession; and those medical men who consider themselves simply a kind of glorified mechanic remain in a purely shop point of view.

To no group of men and women is given a larger opportunity to render real human service than falls to the dentist and the dental nurse. Through the practice of their knowledge and their service life can be made more effective, more useful and

fuller. It can be lengthened in years; it can be given more enjoyment and pleasures; and many of the obstacles which prevent clean living can be levelled.

Even the meagre dental inspection which has been made has been most significant. It has thrown a flood of light and a little deeper into the problems of home and school hygiene. Facts are being discovered—great truths the momentous bearing of which upon life and health are new to all thoughtful people. One more layer of symptom is bored through to the foundation of cause where tinkering and cure must give way to prevention.

The parent, the teacher, the social worker, the nurse, the physician—the public are looking to the dentist to meet and do his clear duty. Every dentist who has the true professional spirit will measure up to this duty; and being a man, he will give substantial aid willingly and generously, according as it is his privilege, in helping his fellow men profits by his knowledge and skill.

No form of practical philanthropy ever had so fair and favorable a beginning. Dental clinics can be established on a proper foundation, the patient paying a nominal charge for service received. Hospital boards and social workers are ready to co-operate with dentists in establishing and maintaining these clinics. Medical inspection of school children has been organized and put into practice; and school authorities are ready to include the examination of the teeth in school inspection, and provide instruction upon the care of the mouth and teeth. Dental and medical schools are beginning to instruct their students in oral and dental hygiene, and the important part it has in helping to increase and maintain public health. The Dental School of Harvard University has been given one thousand dollars, and a promise of more, to carry on research work in preventive dentistry; and a working fellowship has been created. In the free popular lectures on medical subjects offered to the public by medical schools are lectures on dental hygiene. In the crusade against tuberculosis oral and dental conditions play an import-

ant part. The spread of infectious diseases through the neglect of the mouth and teeth is a subject of growing importance.

All these broad and human activities are distinctly within the dentist's sphere; and his responsibility and the part he is to play in the prevention of disease and the prolongation of life stand in his path of public duty. One result of the Boston Conference is that organized bodies of workers, social, charitable, educational and professional stand waiting for him to answer the "*Call to Public Health*"—a call which clearly summons the dentist.

WILLIAM R. WOODBURY.

THE NEED AND SCOPE OF THE PROPOSED NATIONAL DENTAL JOURNAL.

The men who spend their lives in caring for the physical health of those about them, perform the noblest work within the privilege of human powers. This is self-evident, for a sound body, like the air we breathe, is the first requisite of life. All that makes life useful, happy and good, must depend on this hard first condition. The men who minister to the most essential needs of others, become superior beings, and worthy of their honored place in the eyes of men, exactly in proportion to what is given of their best skill and thought.

In dealing, however, with vital tissues, as with other matters beyond the scope of finite wisdom, the best that we can do is poor enough. All living are equally in need of that little Best,—hence any true knowledge or skill acquired by one man, should be shared by all for the common good. In a community of men, in which the individual enjoys free access to the common knowledge of all, each man brings to his work the advantage of many minds, and is more useful by so much, than any other depending wholly on his own abilities. Hence, in a department of life where knowledge is always of first importance and always inadequate, this community of interest and freedom of giving is necessary to the highest good.

Such work must be in its nature, unselfish. The welfare of others being the end, the means can not be identical with those which conduce, primarily, to self interest. This altruistic habit of mind must be the religion of the professional man, and differs from the principles of conduct which govern the commercial world, as naturally as do the arms and legs of a human being. All are needed, but the functions of the upper and lower extremities will be forever different.

All, therefore, which has to do with the advancement of professional life should be removed as far as may be from the contact of commercial interest. The vehicle of the scientific thought of a profession should be controlled by those who produce and use such knowledge. There should be a means of expression through which any man of good sense and repute may obtain a respectful hearing, without fear or favor.

Of constantly increasing usefulness in this first of all professions—the medical—are the specialists in dental and oral surgery and medicine. In a single century, dental science has grown from the blundering empiricism of artisans to a vast bulk of proven knowledge from which has been formulated the rational practice of thousands of educated and highly trained men. This community of specialists has long realized the need of technical journals which should be published by themselves and devoted to their evolving interests.

Every patriotic member of the Dental Profession should rejoice in the work that is being done by the Journal of the Allied Societies in educating its readers to something beyond the bread-and-butter dentistry which during the past sixty years marked the childhood of a new profession. With maturity has come the ideals of men who see beyond the day's work, and this broader conception of usefulness is awakening everywhere a demand for journals of this independent and disinterested character.

The National Dental Association, by its position and authority, is peculiarly fitted to take an important part in this responsible work, and a Committee on Journal, consisting of Dr. Herbert L. Wheeler, New York, chairman; Dr. C. S. Butler, of Buffalo; Dr. F. T. Taylor, of Boston; Dr. F. W. Stiff, of Richmond, and the present writer, have prepared the following circular announcement, which is being sent as a preliminary step, to members of the State Societies:

New York, March 1st, 1909.

DEAR DOCTOR:—

The question of a Journal to be owned and published by the National Dental Association has agitated the profession for the past six years, and in recognition of the demand for such a publication the following announcement is made:

At the meeting of the Association in Boston last July, on the recommendation of the President in his address, and in response to a widespread sentiment among the members, the undersigned committee was appointed to devise ways and means to take the necessary steps for the publication of a Journal, which should at once take high rank and become *authoritative*, on all matters of Professional and Scientific interest to us. With the proposed reorganization of the National Association, which will result, we believe, in a largely increased membership, the time seems to be opportune for the launching of such a Journal. Already membership in the National Society is open to all members of State and Constituent Societies, and such membership carries with it the proposed Journal; but it is assumed that many who may not wish to avail themselves of the opportunity of membership in the National Body will desire to have the Journal, and to all such the subscription price will be two dollars per year.

It is the aim of the Committee to model this publication upon the standard of size, makeup, etc., of the best literary magazines of the day, starting with from fifty to eighty pages of reading matter per issue, using the proceedings of the National Dental Association as a basis and adding, from time to time, the proceedings of such State and local Societies as the Editors may deem of the highest merit.

While advertisements of a high character will be welcomed, it is the purpose of the Publishers to exercise a strict censorship over every item so accepted. The Committee, therefore, anticipate little income from its advertising department during the first several years, and the Journal therefore must depend for its existence upon the direct support of the profession. This policy should in the end prove doubly valuable, not only to the consumer, but to the advertiser whose article is acceptable for publication.

In order to start upon a plane consistent with this program an adequate subscription list must be secured in advance.

This preliminary circular announcement is sent to secure your subscription conditionally upon the Committee's success in obtain-

ing the requisite number of pledges from reputable men throughout the country to justify the undertaking.

You are earnestly requested to sign and return the enclosed conditional agreement, and in making this request the Committee are confident that, upon the success of this project, you will appreciate the importance of the investment to yourself, in value received, aside from the substantial satisfaction of having aided in the progress of our profession.

The following is also enclosed for the signature of the prospective subscriber :

"Upon assurance from the Committee on Journal that sufficient number of agreements, similar to this, duly signed, have been received, I agree to promptly remit the sum of two dollars, payment in advance, entitling me to one year's subscription to the magazine to be owned and published by the National Dental Association."

Any communications concerning this publication may be sent to the undersigned, Secretary of Committee, at 50 West 45th Street, New York City.

It will be the earnest endeavor of this Committee to found and maintain a journal which shall be worthy of its high purpose. The scope and quality of its output will advance with the growth of its facilities, and, when well supported, should become a power in the scientific, educational and ethical phases of our progress.

WILLIAM B. DUNNING.

EXPERIENCES WITH SOME OF THE NEWER METHODS OF ROOT-CANAL TREATMENT*

PRESSURE ANESTHESIA FOLLOWED BY PULP REMOVAL.

BY ARTHUR L. MILES. D. D. S., CAMBRIDGE, MASS.

My first experience in this method was with pure cocain, forced into the pulp with the aid of unvulcanized rubber. I was greatly troubled by the hemorrhage following the removal of the pulp. I am at present using adrenalin-cocain, and by having

* Read before the Boston and Tufts Dental Alumni Association, October 14, 1908.

a cotton-wound broach saturated with zinc chloride ready to use in the canal immediately upon the removal of the pulp am seldom troubled now from this source. It is necessary to use the zinc chloride before the blood flows at all if we would get the best results. My chief difficulty has lain in the uncertainty of obtaining the anesthesia. It is of no use in my hands unless there is a good circulation in the pulp and even then with all the care possible it often causes severe pain. The main advantage, as I see it, lies in the freedom from subsequent discoloration. This is, of course, of great importance, and for this reason I use it in all possible cases in the anterior teeth. I have used the process in molars, but cannot see any advantage in so doing, ordinarily, and I do see some possible disadvantages. It usually takes more time than the old method, and there is a danger, I believe, of leaving some live pulp tissue in the fine, tortuous canals, which may later result in some obscure neuralgia. When the pulp is devitalized with arsenic, slight portions left in this way seldom do any harm. I do not wish to give the impression that I believe in doing less than the utmost possible to remove the entire contents of every canal, using the very finest broaches, but I think we all recognize that there are cases where complete removal is practically impossible. Right here I may say that I have been unable to get smooth broaches sufficiently fine for my use from the regular stock of the dealers, but have had to have them made to order, or else make them myself. I had a case recently where it was impossible to insert an extra fine barbed broach in any of the canals of a lower molar, but with the use of this broach and sulphuric acid was able to reach the ends of all the canals and fill them. This brings me to the subject of the

USE OF METALLIC SODIUM AND POTASSIUM FOR REMOVING CANAL CONTENTS.

This method has had strong advocates. In my hands it has not proven nearly as satisfactory as the use of concentrated sulphuric acid. I find it much slower to use and more difficult to handle and also difficult to keep.

BUCKLEY'S METHOD OF TREATING PUTRESCENT PULPS.

I read somewhere in a dental magazine not many years ago a remark by an eminent dentist that the successful treatment of teeth with putrescent pulps was one of the most difficult opera-

tions in dentistry, and I know that many dentists have been loth to do this work, considering it tedious and unprofitable. In the Dental Cosmos for February, 1905, appeared an article by Dr. J. B. Buckley, of Chicago, which I consider almost epoch-making, placing as it does for the first time, so far as I know, such treatment on a rational and scientific basis. It so appealed to me that I at once began using the method, with the most satisfactory results. The direct pecuniary value in time saved it would be impossible to estimate, to say nothing of the joy of seeing a successful permanent operation. Perhaps you are all using the method, but in case any are not, I would say that it consists in sealing into the putrescent chamber and canals, by means of cement, a mixture of formalin and tricresol, instead of the old method of leaving them open for a few days and then beginning a series of tedious and often unsatisfactory treatments. I have been able to use this method in practically all cases except where there has been a discharge of pus. In such cases I wait a few days until the flow of pus has ceased before sealing in the mixture. In some cases I have found it well to cauterize the area around the apex with zinc chloride before applying the treatment. I have had the most beautiful results with this method. Cases where the teeth were extremely sore and loose, with canal contents in an unmentionable condition and with blood and serum flowing quite freely upon their removal, have been subdued and the canals rendered absolutely free from any suggestion of foul odor and ready for a premanent filling, with one treatment. Very rarely is a second treatment necessary. At the second sitting I remove any debris which may not have been removed the first, if there is any weeping from the apex stop it with zinc chloride, usually wipe out the canals again with the formalin and tricresol mixture, flood them with alcohol, dry and fill. In the drying process, I have found my compressed air system of the greatest assistance. For a root-filling I use almost exclusively eucalyptopercha, containing a little thymol, and followed by a gutta-percha point. I have tried a number of other preparations but nothing seems to be so universally satisfactory. During treating operations I endeavor to keep out absolutely all oral fluids, but almost never apply the dam for this purpose. I find the saliva ejector and absorbent cotton sufficient. I do believe that sterile broaches and freedom from all contamination are important if we wish to do successful work.

A PLEA FOR MORE HUMANE METHODS IN DENTISTRY, WITH SUGGESTIONS FOR PRACTISING SAME.*

BY W. G. EBERSOLE, M. D., D. D. S., CLEVELAND. O.

For years the energies of the writer have been directed towards not only preventing pain and suffering in the dental chair, but in endeavoring to induce other members of the profession to take up the same cause.

It is surprising how little attention has been directed towards this end; that is, towards eliminating pain as a factor in performing dental operations.

Humanity demands at the hands of dentistry more than it has been ready or able to give. The demands of humanity must be met in some way commensurate with its needs and its best interests as a whole.

The seeming disposition to disregard the demands of the laity while making strenuous efforts to meet some of its needs, is the one excuse for inflicting upon you this paper. So great has been the struggle and so strenuous the opposition to dentistry during the past seventy years, that it has lost much which would have been of value to humanity and itself.

It was dentistry that gave to the world anæsthetics and anæsthesia. It was dentistry that made modern and painless surgery a possibility. Medicine, an old and long-established profession stood in a position to receive, use, and did receive and use the discoveries made by dentistry to the very best advantage, and humanity has been benefited beyond the power of mankind to estimate. Down to the present time medicine has been benefited most and humanity much, but dentistry least of all by her discoveries. That dentistry may come into her own, that she may receive most and humanity more of the benefits of anæsthetics and anæsthesia, has been, and is the task which the writer set out to perform.

Horace Fletcher said, and well said, in my presence a short time ago, "that the physical economy of the man of the future will be dependent on the mental and dental." He has also said that "the religious adviser and the medical adviser must become

*Read before The New York Institute of Stomatology, Jan. 5, 1909.

one and the same." In other words, the spiritual and physical counselor must be combined in one, and the influence extended must be principally mental.

As to these statements of the future, I cannot disagree if they are applied to the very distant future, but in the very immediate future, and it is that which concerns us most, I must maintain that if the ideal man is to be produced, it is the dental that must take precedence over the mental. For is it not true that the diseases which the dentist is called upon to treat are the most prevalent known to the human family, and is it not also true that so long as these diseases exist and their effects are felt, both directly and indirectly, upon the physical being, that being cannot approach perfection mentally or physically.

Therefore, with the great preponderance of dental lesions over all other lesions of the body, coupled with the astounding mental indifference to these conditions, it is to dentistry that we must look for the greatest influence in bringing about a reformation of those conditions. Dentistry must first care for these lesions and while doing so, must by judicious and painstaking efforts endeavor to create a mental state which will in time lead that mentality to assert its proper control over both the physical and spiritual being.

Dental lesions directly and indirectly, are responsible for most of the pain and suffering of the physical man. Where pain and suffering exist there can be no peace nor comfort, no contentment nor happiness. Pain and suffering are indications of the pathological, and the ideal life should be free from them.

To most of humanity to-day, pain and dental operations are synonymous terms due to past or immediate impressions. In dentistry, as far as the pain element goes, the experience of the past is the curse of the present. And the experience of the parent has been exaggerated and handed down to the child until the entire human family stand in awe of the dental profession.

This is a strong statement perhaps, and one which I have no doubt some of my hearers will desire to question. But we will ask you to go with us to view a picture that was presented to the writer a number of years ago.

Some twenty-two years ago, as a law student whose health had failed, the writer became interested in the wonderful results accomplished by the then newly discovered anæsthetic,

cocaine. A clinic demonstrating the use of cocaine for the painless extraction of teeth, was given in Carrollton, O., a little country town of 1,200 inhabitants. The physician who was demonstrating the use of this wonderful discovery created a great deal of excitement, and had it not been for one or two cases of cocaine poisoning, it is the writer's belief that practically the whole adult population would have been rendered edentulous in a few days' time, judging by the way teeth were being sacrificed.

So deep an impression was made upon the people in that vicinity, and so great the demand for the use of this wonderful discovery, that local dentists and physicians set about to produce a preparation which would permit the extensive use of this new anæsthetic, and at the same time eradicate the unpleasant symptoms. Finally there was produced an aesthetic which seemed ideal, and the writer was employed in a position that brought him in close contact with dentists and their patients over the country. The preparation was used for extraction of teeth and for minor surgical operations. We were shocked to find that thousands upon thousands of teeth were being sacrificed simply because the patient could not or would not submit to the torture of having them filled. So profound an impression was made that we began an investigation as to the cause or causes of this condition. We heard a cry of distress. We listened, and heard the lamentations of the suffering public against the torture inflicted and the anguish endured while the hard-working dental profession labored to prepare in extremely sensitive teeth cavities which would comply in every respect with the theory of "extension for prevention" as laid down by Dr. Black and his followers:

We looked, and we saw patients with features distorted by fear and suffering, with beads of perspiration rolling from every pore of the body, with every muscle rigid and every nerve strung at the highest tension, endeavoring to stand the tortures of the damned, in order that they might save their teeth and preserve their beauty. And they believed because they had been so told that there was no other way.

While gazing upon this uninviting picture, the thought came, "why need this be?" And after a few days' thought and consideration, the answer came "it need not be so." The belief came that dental operations could be successfully performed without

so much pain, and that the people would welcome with open arms a reformation in this line. So thoroughly were we impressed by this thought that it was communicated to dentists met, and they were many, and while some smiled and said nothing, others laughed and said "ideal, but impossible." So firm was the belief in the correctness of this theory, that to be laughed at simply meant to create a desire to prove it. And from that day to this, we have been fighting with that object in view.

The study of law was abandoned, and that of dentistry and medicine begun and finished. And now, after twenty years and over of untiring study of anæsthetics, we come to you with the statement that methods and means now at command make it possible to perform all dental operations without an iota of actual physical pain. This statement is absolutely correct. But while it is true that all pain can be entirely eliminated from dental operations, I do not think it a possibility for all to so practise it. Nor do I think that any one is practising it in the broad sense in which this statement is made.

While possible, it is yet impossible for most of us to accomplish these results without considerable training. In fact, there is no need of the absolute elimination of the pain element, but there must come a decided reformation in this line if dentistry is to receive her own and stand where the Almighty demands it must stand, that is, at the head of the professions.

Humanitarian methods in dentistry, while giving first thought and consideration to the comfort of the patient during the operation, means dentistry as perfect and as thorough as the most exacting may demand, and yet dentistry so free from pain and suffering that the most timid patient will eagerly submit to its treatment. The demand for this kind of dentistry comes from the patient, and our patients are entitled to and should receive more consideration in the future than has been accorded in the past.

The people come to us to-day with fear and trembling. They abhor dentistry and fear dentists, and most of them seek us only when driven to it by intense suffering. People of to-day cannot and will not stand the torture their forefathers could and did endure. We live and have our being under conditions which produce nervous organisms of so sensitive a nature that the slightest irritation causes suffering. In fact, many times we find

patients whose nervous organisms are such that the mere anticipation of pain is sufficient to cause intense suffering.

It is not this or any one class of patients alone that is demanding relief at our hands. Humanity as a whole is pleading for dental work which can be made free from pain and suffering, and yet conserve the health and beauty of the teeth. The people want it, they must have it, and they will get it, or thousands of teeth will be lost annually through fear of the dentist.

And now, gentlemen, to make a plea for more humane methods and not give some insight into the manner of executing them, would, we believe, be an injustice both to the hearer and to the writer. Therefore, we will endeavor to suggest some of the methods employed in producing results.

The first thing that a beginner in the practice of humanitarian dentistry must learn, is that if he is to succeed he must commence at the foot of the ladder and climb up round by round.

The only advantage he has over those who are now meeting with success, is that the ladder has been built, and all he has to do is to climb and receive the reward at the top.

Another thing that the beginner in the practice of this kind of dentistry must understand, is that it cannot be learned in a few minutes, hours or days. It requires much time and experience. The men who are its strongest advocates and who are the most successful in practicing it, are men who have devoted years to perfecting themselves in this direction.

In practicing humanitarian dentistry, the operator must deal with both real and imaginary pain. He must be as successful in handling one as the other, else he is not a success in this line of work.

Therefore, it is essential that we, in our discussion of this matter, take up both kinds of pain.

The first thing that presents itself to the dentist is the vivid imagination of the patients. This, coupled with the fear and dread most people have of dentists, and dental operations, places many of the patients in a condition bordering on irresponsibility. This condition must be reckoned with before attempting anything else.

To gain confidence, and dispel fear, must be the first thought of the dentist who desires to practice Humanitarian dentistry.

Many men fail here. Most men make light of the patient's

fear and lack of confidence, and a large majority of men have no patience with patients who imagine that they are being hurt. Success comes only when these patients are handled in a way which brings them to a position where they are capable of sound, rational judgment.

This is done in many ways, depending upon the individual case.

First, let your patients know that you are fully aware of their condition and position in the matter, but impress upon them that they have your full sympathy, and that you are just as anxious not to hurt them as they are not to be hurt.

Tell them that in order not to hurt them, you are going to make use of methods and means, which make it possible to do their work free from pain, but that in doing this, you must have their hearty support. Caution them to notify you the moment they feel the slightest pain whatever.

Make no promise to a patient which you do not expect to keep to the letter.

Cultivate a delicate touch. A touch can be cultivated which is both delicate and firm. A touch so light that it fails to irritate, and yet so full of strength and character that it inspires confidence.

In preliminary examinations, if a cavity is found, that is enough. The knowledge that this cavity exists should suffice. Defer a complete examination as to the extent of that cavity, until you have made an appointment to care for that particular case and have plenty of time to investigate and treat existing conditions.

If a patient is suffering, or has been suffering, do not go probing until you have obtained the history of the case. Gain from information furnished an idea of what to expect, whether sensitive dentine, pulpitis, or peri-cementitis. Then proceed in the most cautious manner, to confirm this history, and, finding a condition, treat it, using every precaution not to hurt.

If the rubber is to be applied and there is the least likelihood of causing pain in so doing, have your dental nurse or assistant bathe the gums for a few moments with a solution of cocaine, adrephrin and water. If there is still danger of considerable difficulty in placing the rubber cloth, have the time lengthened, and the cocaine solution used until the gums show blanching.

Then proceed with the utmost care not to cause pain in adjusting the rubber. This is of the greatest importance in many cases. Many times have I seen patients in such a nervous state by the time the dam was in place that they were in no condition to be operated upon.

Having the rubber in place, dry away moisture, being careful not to cause pain in so doing.

Cautiously open up the cavity and remove all debris, using sharp chisels and excavators, resorting to the use of the engine and bur as little as possible, until you have ascertained the kind, nature and sensitiveness of the cavity.

Time and space will not permit discussion of the topical application of obtundants.

We should like to lay down a general rule, however, and that is, all topical remedies should be applied warm to sensitive cavities.

Humanitarian dentistry demands that all pain be eliminated, and a man is a success or failure just in proportion as he is able to do this. Producing pain at one time to avert it at another is not permissible.

If the cavity before us is one requiring more than topical remedies, we must next decide which of the remaining methods is best suited to the case in hand.

Following topical remedies, we consider high pressure anaesthesia next in importance. The high pressure instruments properly used make it possible to excavate the most sensitive teeth absolutely without pain.

Failure in the use of this method is not the fault of the instrument, unless the operator has abused it by careless manipulation.

The writer discovered a year and a half ago, a fact which he made public for the first time at Pittsburg, November 7, 1907, and that is that liquids can be forced through the enamel of the teeth with the high pressure syringe. It has formerly been taught that it was necessary to penetrate the entire layer of enamel before high pressure anaesthesia could be employed, but we have been able to demonstrate beyond any question that such is not the case.

It has been said that High Pressure injures the pulp.

There is no more excuse for injuring or endangering the

life of the pulp in the use of this method, than there is for the physician to injure or endanger the life of his patient in the administration of any of the many poisons that are used thousands of times daily in the treatment of the various diseases.

It is simply a question of dosage. The average dose is administered by the physician and continued, increasing or diminishing the dose, until the desired result is obtained. No two patients respond exactly alike, and in this, as in dentistry, each case is a case unto itself, and as such must be handled independently of all others.

At the moment when that part of the cavity farthest from the point of injection can be prepared painlessly, high pressure should cease if the best results are to be obtained.

Fear need not be created if the anaesthetic effect is extended considerably beyond this point.

The pulp may be anaesthetized with entire safety if necessary, but it is only in the most extreme cases that this is required. It is only when over-dosage or an improper solution is used that much danger exists.

Much injustice has been done both to Humanitarian dentistry and to high pressure anaesthesia by enthusiasts claiming this method suitable for all cases. It is but one means to an end. With it alone Humanitarian dentistry must needs be a failure.

Not that every tooth in the head cannot be reached and thoroughly anaesthetized, but because in our intense desire to prevent pain, we lose sight at the time of other things of equal importance.

There are many cases where I consider it decidedly inhumane to drill an extra cavity which cannot be included in the original one, when other methods at command grant equal immunity from pain without loss of extra tooth substance.

I refer to Cataphoresis and the minor and major general anaesthetics.

Cathapnoresis? *Yes, I will dig up that supposed relic of the past. Bear with me while I do justice to a power which has fallen almost from sight because we, as a profession, fail to understand it, and would not give to it the necessary time to become familiar with the wonderful power for good which it holds and offers to the profession for the seeking thereof.*

Of the methods for obtunding sensitive dentine it offers

most. There is no necessity of making extra cavities nor of bringing about general systemic conditions which will permit the cutting of sensitive dentine without the infliction of pain. Your dosage can be gauged accurately. There is no danger of carrying ptomaine poisoning into the pulp nor of creating depressing systemic conditions.

There are four drawbacks to its use, however.

First, the amount of time consumed in making the application.

Second, the difficulty in procuring suitable apparatus.

Third, the cost of perfect apparatus.

Fourth, and most difficult of all, is to teach the profession to handle it successfully.

There is nothing that the public will pay for so readily as the time spent in preventing pain.

A careful study of the case on hand permits the saving of much time by working on two parts of the mouth at the same time.

For instance, if there are a number of teeth that require filling, open up a cavity in one, insulate it by applying a second piece of rubber over the cavity and covering any metal filling with gutta percha, and then start cataphoresis on that case and while it is working, open up other cavities on the other side of the mouth.

Then when the first cavity is sufficiently obtunded, transfer your electrode to one of the newly opened cavities and complete your preparation of the first cavity and fill the same, and when through, the second cavity will be ready for thorough excavation.

Except for the time consumed in insulating and obtunding, this is an ideal method.

No man who attempts to practice Humanitarian dentistry can afford to be without a cataphoric outfit, nor can he be without a high pressure syringe.

Men fail with these because they will not devote sufficient time to study that they may become expert in their use.

The busy man will not take time, because he does not need to do so, while his patients will submit to the old way.

It is in the young men, therefore, that the possibility of Humanitarian dentistry lies.

Before turning from local means for producing relief from

pain and suffering, I wish to call your attention to the Leucodescent Therapeutic Lamp, with which I have been conducting experiments in a number of cases with very gratifying results.

This lamp is not a "cure all," but is a most valuable adjunct in the practice of all other therapeutic means. I do not know that it will be classed as a local agent, because its influence can be felt upon the entire system if properly applied. But I do know that in local affectations it can be used with decided benefit. I am not able to explain exactly how it produces its effect, but we do know that light is of universal necessity to the life and well-being of animal and vegetable cell development and sustenance. With this fairly understood, we are in a position to believe that the light rays may act much as do the sun rays in the production of life and health.

There is no question but what light applied with scientific intelligence as an adjunct to other means, will do more than any other one thing can do to restore the normal conditions physiologically.

I have been experimenting with the 500-candle power lamp, and the cases I have been handling have all had to do with dental lesions.

One case which is of greatest interest, is a lady about forty-six years of age who has been suffering for years with formation of pulp stones. She has been a sufferer to a greater or less extent from this affliction for a number of years in spite of all treatment given, and during a certain period in the month has always suffered agonies in her face and teeth.

Considering it a most unfavorable case for the Leucodescent treatment, and desiring to put the light at as severe a test as possible, I decided to see what could be accomplished by using it here.

Through the use of this method we have been enabled to give this patient two months of comfort and freeness from pain and suffering.

If when this patient was suffering intensely and we made use of the lamp, it was but a few moments until the pain subsided entirely, while the effect upon the nervous tissue was of the most soothing and quieting kind.

While seeking relief from pain only we were very much surprised to find after three or four treatments that the deafness

of the patient which extended over a number of years, had been decidedly relieved, and after applying this treatment to the ears directly, we are able to say that at the present time the lady's hearing is as keen if not more acute than the majority of mankind.

Other cases in which we have used it with marked success, are for the pain following the extraction of abscessed teeth, and for the pain and soreness occasioned by the erupting of third molars, and in cases of odontalgia and pericementitis.

While of very decided value in the relief of pain and suffering, it is of inestimable value in extremely nervous patients. This is accomplished by using the blue rays which produce an anaesthetic or analgesic effect.

I have purposely avoided referring to a local anaesthesia producing by a hypodermic injection of cocaine or kindred preparations, because I believe that there are agencies at our command which make it possible to perform all necessary operations without resorting to the hypodermic needle. Of morphine, acetanilid, phenacitine and kindred preparations which act upon the nervous tissue in such a way as to render them partly inactive to stimulation, I cannot, in this paper, take the time to give them due consideration.

Of general anaesthetics, major and minor, I will say but little, because I believe that with the single exception of nitrous oxide gas, their place lies only in the surgical field, and yet, chloroform, ether, ethyl chloride and somnoform may be used in opening abscesses either through tooth or gum and in kindred operations. Chloroform is used by some men to produce the analgesic state when the excavation of sensitive dentine may be accomplished without pain to the patient.

Of general anaesthetics, nitrous oxide gas is the one par excellence for dental use.

Many substitutes have been offered and with each there have been announcements of great discoveries, but in time all have been compelled to admit that nitrous oxide gas stands in a class by itself as far as safety is concerned. As to the duration of the surgical stage, all depends upon how it is administered and for what purpose.

A number of men are using it with marked success in the preparation of sensitive cavities, placing the patient partially under the influence of the same.

Recently the writer has taken up the use of nitrous oxide and oxygen in the preparation of sensitive cavities by placing the patient in what is known as the analgesic state. We have not been working long enough with this manner of procedure to be able to state what the final outcome will be, nor to give you the result of this method of procedure as compared with the use of cataphoresis or high pressure anaesthesia.

But there are many places where this method can be used very advantageously, and where time is a question of importance, this method offers most, for with proper apparatus, nitrous oxide and oxygen can be adjusted and administered so quickly that the time element may be reduced to the minimum.

We have been unable to make as free use of this method as the average practitioner might make, because of the fact that our patients have all been educated to have the pain element eliminated by other methods and means. And many of them do not take kindly to a change in this direction.

There are, however, many cases and conditions where it is a great time saver, and we say of this as we say of other means and methods described, that the human or humane dentist cannot well afford to be without an apparatus of this kind.

In all operations where freedom from pain cannot be obtained by the use of the means already cited, the writer maintains that the best interests of humanity demand the use of general anaesthetics even to the use of chloroform, if needs be.

Now in conclusion, let me say that the demand for anaesthetics or obtunding agents in dentistry is far greater than that of the medical profession. A physician may attend his professional duties day in and day out, and not be called upon to perform any act which would cause sufficient suffering to call for an anaesthetic. But with the dentist there is not a day that passes but that he will be required to make use of some agent to prevent his patients suffering torture, and therefore, it is the dental profession that should know most about anaesthetics and their use.

The failure to use more humane methods in performing dental operations, has caused a delay in the dental profession's obtaining proper recognition and standing.

The question has been asked: "How far are you justified by conditions presenting in dental practice in administering anaesthetics for the relief of the pain factor?"

In answer we would say that we are justified in using anaesthetics, either general or local, as the case may demand, until pain has been eliminated from all dental operations.

One writer has said: "That the fact that the patient demands an anaesthetic can never be the justification for its use."

To this statement we wish to enter a most emphatic denial as to its correctness. Humanity as a whole is demanding and has a right to demand that we perform dental operations without causing pain. And this cannot be accomplished without the use of some anaesthetic.

The same writer from whom we have quoted, writes as follows: "That anaesthetics are administered for exactly this reason, 'Because patient prefers this or that agent.' 'Because a particular agent is or is not a Practice Builder' or a 'Money Maker'—God save the mark—are among the reasons given in recent dental literature by men who with the courage of their ignorance have thus sought to justify their use of anaesthetic agents."

"Theirs is the type of mind that we have upon former occasions referred to as the kind which would have been benefited by listening to a course of lectures on ethics during their college career. It is not a case of immorality, but amorality."

Later in the same article the writer continues: "Frankly admitting that many dental operations are productive of a degree of pain which is beyond the limit of ordinary endurance, and that to inflict such a burden of pain is, or may be in many instances damaging to the nervous system of a delicately organized patient, there is on the other hand much easily bearable suffering from dental operations, for the relief of which an anaesthetic is not only not needed but where on moral ground we believe its use is distinctly wrong. The moral point at issue is this. It is manifestly impossible to eliminate from the conditions of human existence the demand which circumstances inevitably make from time to time upon the organism to bear pain in some degree great or less. The resort to anaesthetics or other artificial means for escaping the primal curse is too often a device, which "makes cowards of us all," by destroying the powers of both moral and physical resistance to the ordinary stress of life. There is a danger in this tendency to continually "sugar coat" disagreeable sensation, because it will in time destroy the power of human endurance."

My reply was then, and is now: "My Dear Sir—Are you not aware that if your theory prove true that the people of to-day should be able to bear the torture of the very damned without a cry, and be courageous enough to face death without a tremor?"

For a century past the conservative pain inflicting part of the dental profession has been dealing out dental operations under the most favorable conditions to cause pain and suffering and most of its followers have embraced the opportunity, and as a result, we have—what? A strong race of people capable of enduring any amount of suffering?

Ah no, my dear sir. On the contrary we have made cowards of almost the entire part of the human family where dentistry exists, and the greatest cowards of them all are the dentists themselves. Almost the entire human family cowers and cringes at the very approach of a dentist, and this, too, at the end of almost a century of the most excruciatingly painful "toning up" or "moral dentistry," the most "conservative" could desire.

Painful dentistry has made cowards of most of mankind. The great fear possessed by the laity has caused the loss of countless numbers of teeth and the neglect of many times that number. The loss or neglect of teeth not only seriously interferes with the normal digestive functions by failing to properly reduce food to a condition most favorable for the action of the digestive forces, but by the pain caused by this neglect, creates conditions far more favorable for the production of inebriety, hysteria, low moral tone and loss of vigor than ever was or will be caused by the elimination of the pain factor from dental operations. And who is responsible for the condition which exists? We answer conservative non-anaesthetic using dentists of the past and present!

Conservatism, while to be admired in many things, has retarded progress too long in this direction. More humane methods are at hand and must be employed by the dental profession at large.

Painless dentistry must come, even as painless surgery came. The hand-writing has appeared on the wall. Let all heed the warning, lest they, too, be destroyed as were the sceptics and disbelievers of old.

It is ours to go forth teaching the doctrine of more humane methods in dentistry until every member of the profession be-

comes imbued with the spirit of pain elimination, and every dental college in the land is teaching a thoroughly practicable course in anaesthetics and anaesthesia.

It is ours to spread the gospel of humanitarian dentistry, preaching these things till every man, woman and child comes to look upon dentistry, as they do on medicine, that is, as simply a disagreeable necessity.

Let us do these things and humanity, the profession, and Providence will bestow upon us their richest blessing.

HUMANE METHODS OF WEDGING*

BY S. E. DAVENPORT, D. D. S., M. D. S.

The wedging of teeth, like other departments of operative dentistry, has been subject to fads and fancies, but the many changes of method have gradually resulted in considerable improvement.

An accurate history of wedging, as practised by good operators during the last thirty years, would describe many methods, most of which have been punctuated by the complaints and occasional rebellion of suffering patients.

It is probably true that the many objections to rubber and wood for wedging have been so recognized of late years that they are now seldom used for the purpose.

Indeed, those two materials are so nearly obsolete that it would be a waste of time to catalogue their many objectionable qualities, active and passive, but mostly active, and they may be set down as mainly historical members of the wedging family, with a disgraceful past.

At the present time there are in general use for wedging a number of materials, all of which are humane in their action, when properly used, but differing in result according to the shape of the teeth being separated.

At this point it will probably be well to call attention to two important phases of the question, a recognition of which will be helpful both to dentist and patient.

* Read before The New York Institute of Stomatology, December 1, 1908.

In the first place, long experience and considerable study of the subject enables the writer to state very positively that teeth can be separated a considerable distance with practically no pain and but little soreness if the proper wedging material be chosen and the gum not encroached upon.

The last two clauses of the last sentence really mean the same thing, for if the dentist has studied the question and understands the need of each situation as presented, he will be able to select a wedging material which will do the work without coming in contact with the soft parts.

Orthodontists and dentists pretty generally agree that the teeth can be moved long distances without special discomfort to the patient if their wires and ligatures are kept away from the gum.

While the teeth which dentists are called upon to wedge present conditions of considerable variety, they may for present purposes be divided into two classes. First, teeth whose approximate surfaces are nearly parallel, such teeth being large at the gum margin; second, those teeth more ideal in shape, with constricted necks and approximal surfaces tapering sharply to knuckles firmly in contact near the masticating surface.

Class one, with sides nearly parallel, can probably be better wedged by the use of tape, made of either cotton or linen, so waxed or permeated by paraffine or other substance as to prevent much absorption of the food particles which makes unwaxed tape offensive in a short time.

Nearly thirty years ago Dr. L. D. Shepard, of Boston, presented this method of wedging in a very scientific manner before the Connecticut Valley Dental Society at Springfield, Mass.

The writer believes Dr. Shepard to have been the first to introduce to the profession a tape which could be used without becoming offensive in the mouth and a system so complete and accurate that either dentist or patient, when instructed, could obtain gradual results with a minimum of discomfort.

Dr. E. A. Bogue, of New York City, has perfected this method of wedging to a high degree and discovered in Paris, years ago, a thin tape with glazed surface and fine texture made of linen and cotton mixed, which has proved most satisfactory.

Among others who have given considerable attention to this important matter may be mentioned, Dr. C. Frank Bliven, of

Worcester and Boston, who has also, the writer believes, devised a special tape for the purpose.

Added emphasis may worthily be given to the fact that patients who are at all skilful with their fingers may be instructed regarding this tape method of wedging and enabled to prepare spaces for filling, thereby saving the time of all concerned.

The detail of this instruction is probably unnecessary, as all, no doubt, are familiar with the plan of adding one or two thickness of tape when the wedge is changed either by the patient or the dentist's assistant. The use of tape, however, is not indicated with teeth of class two as described above, where the approximal surfaces touch at a single point only, near the masticating surface, for with such teeth, tape is either placed with difficulty, or, if well placed, is likely soon to be forced into the gum.

The truth of this has been recognized by many operators who have obviated the difficulty in different ways.

Dr. Karl C. Smith, of New York, uses for wedging teeth of class two, linen carpet thread (Barbour's Irish Flax) of various sizes, which he ties either single or double, according to the need of the individual case, around the knuckles between the teeth.

Through the courtesy of Dr. Karl C. Smith, the writer has been able to test the Irish flax carpet thread and finds that the material does not swell when wet, which means that its wedging action depends upon the force with which it is tied.

Dr. H. Griffen Marshall, of New York, has for years used with success the following method:

He passes a silk thread between the teeth and before tying the silk, packs in a few fibres of absorbent cotton. By knotting the silk around the cotton, the wedge is prevented from slipping into the gum and the expansion of the cotton is effective in separating the teeth.

Men all over the world have for years recognized the difficulty of wedging teeth in class two and have experimented with many materials in the effort to so secure the wedge that the very success of its action would not cause it to work into the gum.

Most of these experiments have been with materials which could be tied between the teeth, either with or without a few fibres of cotton, the knuckles of the teeth being depended upon to prevent a movement of the wedge toward the gum. The use of cotton is objectionable as it becomes offensive in a few hours

and most of the other materials, like Dr. Karl Smith's carpet thread, depend for their action upon the force with which they are tied, rather than upon any special swelling property.

The best way to test all these materials for this special property, outside the mouth, is to place a carefully measured length of the material, say, one inch, in water for twenty-four or forty-eight hours. If it has shrunk to even seven-eighths of its original length in twenty-four hours it will have increased its calibre correspondingly, and for both reasons, therefore, is a valuable wedging material for class two.

At this point it may be well to refer to some contributions on the subject of wedging teeth, made at a meeting of the New York Institute of Stomatology in May, 1899.

The methods of Drs. Karl C. Smith and H. G. Marshall referred to above, were described at that meeting, Dr. C. B. Parker, of Brooklyn, Dr. F. Milton Smith and the writer also participating in the discussion of the subject.

The writer at that meeting described the so-called "Fish-line" method, giving the name of its originator and other information of sufficient value, probably, to make excusable here the following quotation from his remarks:

"Dr. Isaac B. Davenport, of Paris, France, nearly ten years ago (now nearly twenty years ago) noticed in the mouth of a patient who had just arrived in one of the steamers from Boston, a wedge consisting of a doubled silk, tied in a manner similar to that described by Dr. Marshall, with fibres of cotton between. It instantly occurred to Dr. Davenport that fish-line which he was then using for regulating purposes, would be very valuable also for wedging, and after experimenting with different sizes, he came to the conclusion that it was better to use the line without cotton. The method is especially applicable to those cases where the teeth are snugly in contact at the masticating surface with a V-shaped space at the gum, and where it is almost impossible to apply tape, wood or rubber wedges without having them slip down against the gum. * * * While sufficient space for filling may often be gained in twelve hours with but little soreness, one line will continue swelling for two or three days, where extensive wedging is needed. The method has been of the greatest service in my hands for many reasons, the most important of which is that the gum is not encroached upon, in-

flammation of the gum being, in my opinion, the principal cause of soreness in wedging. My experience in regulating teaches me that teeth can be moved for a considerable distance without much soreness, provided the gum is not injured. * * * One great advantage of this material over tape or absorbent cotton used in wedging is that it does not become offensive when left in the mouth for many days."

It will be noticed that the use of the fish-line method is indicated in the class of teeth which has heretofore been most difficult to wedge by any known method, which makes the fish-line or like material of the greatest value.

In other words, teeth which are so tightly knuckled that it is almost impossible to get any material between them are easily wedged by the fish-line method and without danger of the material getting into the gum.

The objections to this method are the expense of the fish-line and the difficulty of procuring it, and as long as these objections remain in force the use of the method cannot become at all general.

The fish-line used by the writer is imported from Paris, although Drs. C. B. Parker and H. W. Gillett inform him that they have secured satisfactory material from Abbey & Imbrie, 18 Vesey Street, New York City.

Even if there were a number of places where good fish-line could be purchased in this country, it is imported and its cost would be quite an item in a country practice where low fees govern.

For some time the writer, recognizing the objections referred to, as well as the great value of the method, has experimented with many materials, hoping to get something as effective as fish-line, which would be inexpensive and which could be obtained anywhere, even in an ordinary country store.

He takes great pleasure in presenting as the material best adapted for the purpose, which he has been able to find up to the present time, Clark's O. N. T. crochet cotton No. 15. This well known material can be purchased at the New York City department stores for five cents a spool of two hundred yards.

It does not continue to shrink and swell in moisture for three days as does fish-line, but repeated tests prove that one inch of the material becomes seven-eighths of an inch when immersed in

water for twenty-four hours and there is a slight shrinkage during the second twenty-four hours.

The successful action of this material depends even more than does the fish-line upon the way it is tied.

In almost every case it should be used double in accordance with the following directions:

A piece of waxed dental floss about six inches long is doubled in the center and through the loop made is threaded a piece of the wedging material, also about six inches long.

One strand of the dental floss is passed between the teeth to be wedged and then the other, the looped end containing the wedging thread being placed on the side of the teeth most convenient. The floss silk is then pulled between the teeth until the loop of the wedging material appears, when the silk is pulled out of the loop and thrown aside.

One free end of the wedge material is then brought over above the teeth and threaded through the loop, after which an end is taken in each hand and pulled tightly.

Care should be taken to draw the loop until it comes between the teeth and the force used draws the material away from the gum and around the knuckles of the two teeth. A square knot is then tied on the cheek side and the ends cut, not too close to the knot.

It is important that the square knot should be used so that the material will not untie, or the knot slip. If much space is required the wedge may be changed two or three times and sometimes teeth are so placed that the best results are gained by using the line wedge first, to gain a little space and then following with tape.

Dentists of the old school, though very skilful, were not particularly careful of their patients, and their methods of wedging, while positive, could not be called humane. In these days more attention is being paid to the comfort of patients and one way in which dentists may make themselves more useful and more popular is by the adoption of humane methods of wedging

UNION MEETING OF THE ALLIED SOCIETIES.

A meeting of the Allied Societies was called by the Metropolitan District of the Massachusetts Dental Society at the Boston City Club on the evening of Saturday, January 16, 1909. The purpose of the meeting was the inauguration of the week of conference under the auspices of the Dental Hygiene Council of Massachusetts. Many members of the other societies in the Alliance enjoyed the hospitality of the Metropolitan District, the number present being 206, members and guests.

Dr. Eugene H. Smith, Dean of the Dental Department of Harvard University, presided at the banquet, and after the tables were cleared, spoke as follows:

In behalf of the Metropolitan District of the Massachusetts State Dental Society, I extend to all present, members and guests alike, a hearty welcome.

This meeting is not only the beginning, but the endorsement by the dental profession, through the medium of the Metropolitan District, of a series of meetings to be held next week in various halls in our city, under the auspices of the Dental Hygiene Council of Massachusetts, South End House, Twentieth Century Club, Monday Evening Club and the Dental Societies of the State.

During next week, which is to be known as "Conference Week," the travelling exhibit of the Dental Hygiene Council will be on exhibition at the Twentieth Century Club and the Town Room, 3 and 4 Joy street.

I am told that this is the first exhibit of its kind ever assembled.

The State Conference is also the first organized series of meetings to be devoted to the consideration of the welfare of the school children through the channel of oral and dental hygiene.

It is quite in keeping with the tradition of the state that this new movement, like so many others, should have its beginning within her borders. A State always ready to lead, and whose history is replete with records of the activities of her citizens in the various fields of human endeavor.

It is, therefore, eminently fitting that the State should place the seal of approval on the splendid work already done by the Dental Hygiene Council, and voice a welcome to the distinguished men, many of whom are here from other States, who are to take part in this conference.

Among our State officials I know of no one better fitted to speak the welcome of the Commonwealth than the distinguished young man who honors us this evening with his presence. I now have the honor to present the Hon. Louis A. Frothingham, Lieutenant Governor of Massachusetts.

Mr. Frothingham was greeted by a rising salute and long-continued applause, and when this had subsided he spoke in part as follows:

"Mr. Toastmaster, Ladies and Gentlemen:—It is rather appalling to me, when I look over the subjects of papers which distinguished gentlemen are to read before you, and feel that I must address you first, for I am not in any sense distinguished. But it gives me great pleasure to extend the welcome of the Commonwealth to men who have met for such a worthy purpose as yours.

"A small boy, curious and inquisitive as all small boys are, asked his father 'where was mother born?' and being told that her birthplace was London, pursued his line of inquiry by asking, 'and where were you born, Papa?' 'In New York, my son,' was the reply. But the lad was not yet satisfied, and so he asked, 'And where was I born?' 'Why, you were born in Boston; right here, my dear; why?' 'Because it has always seemed strange to me how we all happened to meet.'

"I am afraid that I can hardly qualify as a son among you, and it seems strange that I, a mere layman, should meet with such a body of men, and be one among these experts and devotees of one of the noblest and best of all professions.

"Probably no other State in the Union has done more, if as much as Massachusetts in the cause of medicine, through her officials and the various organizations which have led in scientific investigation and in the practice of the various branches of medicine and surgery.

"In this noble work no man was more zealous, conscientious and efficient than the late Secretary of the State Board of Health, Dr. Charles Harrington, who died while in Europe last summer. He was one of the types of that class of men who are willing to give up the practice of a lucrative profession to serve the Commonwealth.

"Therefore, because of such men and my firm conviction that they can be found in the ranks of this body, I gladly welcome you,

for I know you are ready to help those in need without exacting compensation for your work of education and the relief and prevention of physical suffering.

"There should also be physicians to visit factories, especially those where minors are employed, and see what the prevailing conditions are under which they work, and remove them if necessary. There should be not only inspection of factories, but of mercantile establishments and work shops, with detailed reports to the proper authorities.

"It is curious to note that in this time of enthusiasm in the progress of dental hygiene reform, there should be but one place where examinations of the teeth of children should be made. That was in Malden, Middlesex County.* Out of 1,599 children examined the teeth of only 389 were found to be in good condition, while those of 502 were found to be in very bad condition. This system of examination is being adopted elsewhere, however, thus showing not only that the need exists and is recognized, but also that the people are waking up on the subject.

"We are ready to co-operate, so that these physicians, who cannot do all the work without assistance by the authorities and the people, may be able to accomplish their aims."

Mr. Frothingham related instances of much trouble in candy factories, where the teeth of employed were found to be in bad condition; and even worse conditions in hat factories, in two of which a large number had diseases of the gums and discharges therefrom, because of the use of nitrate of mercury in treating the skins and furs.

"In the examination of minors," he continued, "especial pains should be taken to get at all the facts, thus making this a most important part of the work of the State."

After a tribute to the late Dr. Bigelow and the late Dr. Shattuck, Mr. Frothingham said in closing: "It is a special pleasure to me to welcome you, because you come here from altruistic motives, remembering that health and happiness come before anything else in this world of ours, and are ready to do your share in their attainment."

Dr. Smith—The name of Professor Fisher means much to

(*The examination of the teeth of children in public schools was conducted in a systematic manner in Brookline, Mass., previous to the adoption of the same methods in Malden, and it was from the Brookline work and Prof. Potter's ideas, that the Malden work was begun.—*Ed.*)

the people and also means a great deal to any society of Scientists. He stands in the front rank of scientific investigators and close to the hearts of the people. If his claim for distinction rested wholly on his splendid work in the field of dietetics, I might with propriety introduce him as a Dietarian. But we know that his great intellectual force has also been directed in various ways for the benefit of the human race. We find him active in the Anti-Tuberculosis Association and in the Committee of One Hundred of the American Association for the Advancement of Science on National Health. I, therefore, must introduce him as a Scientific Benefactor of the Human Family. I present Professor Fisher, of Yale University, who will speak on "Mastication, Diet and Endurance."

Prof. Irving Fischer—Specialists in medicine are prone to over-estimate their importance, but dentists seem to be an exception. The far reaching relations of dental health or disease, to health or disease in general, are as yet very little appreciated.

The teeth lie at the gateway of the alimentary canal and their use, or abuse, constitutes the first step in the processes of digestion and assimilation. The chief conditions of healthful living are only a few in number: Fresh air, exercise, rest, freedom from anxiety, and last but not least, diet, constitute the chief factors. Without derogating from the importance of any of these factors, we may lay special emphasis on diet, particularly as it is at present perhaps the least emphasized and understood. The condition of the teeth is a tell-tale as to diet. The fact that dental decay is so common in civilized man, and far more common, apparently, than in uncivilized man or animals, is striking evidence that there is something wrong with what men eat, or how they eat, or both.

It is little short of amazing that man cannot be said as yet to know what is best for him. We do not know what the original or natural diet of the human race was under primitive conditions, nor what is the best and most natural diet or diets under existing conditions. The consequence is while physiologists are engaged in studies and controversies which will probably not be brought to a successful end for at least a generation, faddists and food reformers are proclaiming all sorts of diets as best adapted to human health. The Salisbury diet, the vegetarian, fruitarian, and nutarian diets, and the raw food diets are cases in point.

During the last few years, in studying the factors of econ-

omic working power, I have collected a number of facts in regard to diet of races and individuals. Several hundred individuals have contributed their personal experiences. Among them are many oddities. One man has lived for twelve years on cow's milk alone, and apparently would have us all follow his example. Another is desirous of pushing a joint stock company to colonize a coral island near Australia for the purpose of proving that an exclusive diet of cocoanuts is the proper one for mankind.

Dentists would be more apt to look with favor on the South Sea Island enthusiast than on the advocate of cow's milk. Personally I take much satisfaction in the thought that there is increasing experimentation in diet, even though it reaches fantastic forms, for however wrong these special diets may be, experience with them always contains a lesson, and they certainly cannot be much more wrong than the average diet of civilized man. But in the long years before the question of what to eat can be satisfactorily settled, we may, I believe, make better use of our time at present in studying how to eat, and possibly the latter question will help solve the former.

I think there can be no doubt that the average man in civilization eats without sufficient mastication. The evidence that this is true is four-fold.

First, it is a fact that civilized man has tried to avoid the necessity of slow mastication by preparing his food in pulverized, liquefied, or pappified form. Instead of using his own grinding apparatus, he has invented machines for grinding food before it reaches his mouth. Soft porridge, further liquefied by milk, jams, puddings, etc., have been contrived and used, and it is not uncommon to "wash down" all food with water expressly taken for this purpose.

Second, civilization has brought with it a great pressure on *time*, and this pressure has particularly been felt at meal time. The "quick lunch counter" is not a natural institution, but one of the products of civilization. With the advent of time-keeping, we have come to live by the clock. We make engagements at fixed hours and abbreviate our meal times to meet these engagements. The animal or the uncivilized man to whom a watch or a clock is unknown, does not hang over himself any time appointments, and eats his meal in peace.

Third, that we eat too fast is shown by the fact that the

few who do not do so have in general better teeth. At any rate the facts which Dr. Harry Campbell has accumulated seem to prove this conclusively.

Fourth, experience with thorough mastication has resulted in greater health and efficiency.

It is this fourth point which I would like especially to emphasize to-night. My own interest as an economist in all these subjects is in reference to national efficiency. I have come to believe that the working power, even of the so-called "well man" is really a small fraction of what it might become if all the influences which make for increased efficiency could be brought to bear. Among these influences, mastication has an important place.

Three years ago, I began at Yale an experiment to discover whether the claims of Mr. Horace Fletcher as to the benefit obtainable from thorough mastication were true. Some graduate students, who were engaged in collecting and sorting statistics in regard to diet and endurance, offered themselves as subjects for experiment. Feeling that the work ought really to be done by a physiologist rather than an economist, I asked Professor Chittenden to undertake it. This he was unable to do on account of other somewhat similar work already undertaken, but he suggested that I should undertake the work myself, and offered to co-operate. It was largely because I did not feel competent myself to prescribe any specific diet that I determined instead to test Mr. Fletcher's theory that each man could prescribe for himself. I therefore asked the nine subjects who volunteered, to follow carefully Mr. Fletcher's two rules; first, to masticate each morsel of solid food thoroughly and to sip liquid food, with the attention, however, on the taste and enjoyment of the food, and not on the mere mechanical act of mastication; and second, to follow implicitly the guide of individual appetite as to the quantity and quality of foods to be eaten. The men formed an eating club and supplied their own needs according to their own desires. A careful record was kept of the quantities consumed and of the proportions of protein, fat and carbohydrate. This record was facilitated by weighing each kind of food in the kitchen and supplying it in multiples of 100 calories each, and the calculation of the proportions of protein, fat and carbohydrate were made by means of my mechanical diet indicator, described in the American Jour-

nal of Physiology and the Journal of the American Medical Association. I will speak a little later of the interesting results which followed as to the amount of food eaten and the proportion of protein.

The main purpose of the experiment was to discover what, if any, effect would be produced on physical and mental endurance. Some very searching tests of physical endurance were undertaken at the beginning of the experiment, and at the end of two and one-half months, from which it appeared that the physical endurance of the group had, on the average, improved over fifty per cent. Tests of strength were also made which showed, however, no very great change. A distinction between strength and endurance was made. Strength is measured by the utmost force a muscle can exert *once*, endurance by the number of times a given exertion can be repeated when that exertion at the outset requires a given fraction of the strength.

The tests of physical endurance were of six kinds, the most important being "deep-knee bending," raising the legs while lying down, and lifting a 25-pound dumbbell with the biceps.

In respect to the food eaten, several interesting things were noticed. In the first place, the men spoke of discovering unsuspected flavors in simple foods, such as bread; second, the amount of daily food consumed decreased slightly; and third, the amount of protein was decreased about twenty per cent., and the use of flesh foods decreased about thirty per cent.

It is an interesting question for the physiologist to say why thorough mastication should lead to a reduction in the use of flesh foods and other foods high in protein. A provisional guess may be made. The high protein food of carnivorous animals does not need mastication; the low protein food of the frugiverous animals does. Meat can be eaten fast with relative impunity, but cereals cannot. It would seem natural, therefore, that when men bolt their food, they should instinctively turn to foods which can be bolted with impunity, and when they gave up the habit of food bolting, they would instinctively turn back to the foods which require thorough mastication. In other words, when we eat like dogs, we tend to eat the same kind of food, and when we eat like slow eating animals, for instance, horses or monkeys, we tend to a greater use of the classes of food which those animals employ.

After the test at the end of two and one-half months, the

experiment was again continued for an equal period, making five months in all. In this second half, a third rule was added to the two which Mr. Fletcher enjoins. This was that when there was any doubt as between a food high and a food low in protein, the men should voluntarily choose the low-protein food. This choice was never exercised against the appetite, but always with its consent. The purpose was to ascertain whether the appetite would consent to a lowering in the protein and how far.

We had already found that by following Mr. Fletcher's rules, the men decreased their protein unconsciously. The attempt was now made to see whether this decrease could be accelerated without doing violence to the appetite, and also what the effect would be upon endurance. At the close of five months the protein was reduced to half and the flesh-foods to one-sixth the original quantities, while the endurance showed an improvement of over ninety per cent. of eight of the men compared with the beginning, but a reduction for one. He had been the least assiduous of the entire group. In fact several men had commented on this fact throughout the course of the experiment. His exception tended therefore rather to confirm the general result than to contradict it.

The tests of endurance were so severe that after this mastication experiment was over, it was determined to substitute some simpler and less painful, and at the same time, more accurate method of measuring endurance. This was obtained by means of an ergometer constructed on a special principle, and now in the Yale Gymnasium. By means of this ergometer a number of different cases of endurance were measured. Endurance is measured by the number of "lifts" which the student can achieve on the machine. This is ordinarily for Yale students, from 40 to 50, but in some cases it exceeds 100. The record among the Yale athletes who were tested was 175. When Mr. Fletcher visited New Haven, we were anxious to see what this apostle of mastication might be able to do when tested on the endurance machine. The result surprised him quite as much as it did Dr. Anderson, Director of the Yale Gymnasium, and all of us; for he doubled the record, bringing it up to 350, at which point he stopped, however, not because he had reached his limit, but because he had doubled the record. Since then the record has been again broken by Karl Mann, the celebrated German vegetarian athlete. He carried it up to the almost incredible number of 763.

But Karl Mann is young, and an athlete. The fact that an individual like Mr. Fletcher, nearly 60 years old, who 10 years ago was refused for life insurance, could sustain a record on the endurance machine some seven or eight times that of the ordinary Yale student, confirms the result of the previous experiment that mastication will lead to an improvement in physical efficiency.

Since these experiments at Yale were performed, they have been tried with similar results in other places, particularly at the Springfield Y. M. C. A. Training Clubs under Dr. Elmer Berry. The results of his experiments with runners were particularly interesting because they seemed to show that the mastication had a beneficial effect on endurance, not simply through the lowering of the protein which resulted from its use, but also in some other way; for the men who "Fletcherized" were superior to those who were on a prescribed low-protein diet.

A large number of personal experiences confirmatory of these general conclusions have been collected by Mr. Fletcher, by his son-in-law, Mr. Von Someren, of Venice; Dr. Hubert Higgins, formerly of Cambridge, England, and myself. Among the individuals who have become especially enthusiastic should be included these very men who have collected material, and many other well known persons, such as Mr. Goodwin Brown, a New York lawyer, formerly on the Yonkers Board of Health and the New York State Committee to Supervise the Diet of the State Insane; Mr. Dessar, a New York artist, to say nothing of the predecessors in Mr. Fletcher's mastication, such as Mr. Gladstone. Among the individual masticators recorded, one occasionally finds also a centenarian. Some of the records rest on newspaper reports, such as the reputed centenarian, Mr. Kelly, of Providence, R. I., who was said to have reached the age of 104 after a life-long habit of spending an hour at each meal. A thoroughly authentic and carefully studied case is found in Mr. Albert G. Dow, who lived within a few months of 100, and who ascribed his longevity especially to the habit of thorough mastication acquired in early life.

I believe the great wave of enthusiasm for health reform now spreading over the country and the world, and particularly the interest in the subject of diet and thorough mastication, gives a great opportunity for dentists to co-operate in this good work,

of which they will not, I believe, be slow to avail themselves. The opportunity is, of course, not one for making larger or more numerous professional fees; for dentists, like medical men, make best progress in their profession by doing work which tends to dispense with their services.

Many dentists to-day are turning with enthusiasm from the old habit of merely mending defective teeth to prophylaxis. President Angell, of the University of Michigan, tells me that the graduates of the dental school there are in some places making a practice of caring for children's teeth by stated visits to prevent their decay, and it is now by no means uncommon for dentists to instruct their patients how to clean their teeth with this end in view. But as we proceed step by step back toward the original causes of disease, we shall go further than the application of the tooth brush.

The most important message which the dentists have to give is, I believe, the simplest, i. e., thorough mastication. The very fact that almost none of us can entirely keep out of the dentists chair gives the dentist a wonderful opportunity. A long experience in preaching hygiene convinces me that the psychologic moment to interest the unbeliever is when he is ailing. Dentists have their patients at just such moments, when they are especially willing to listen to good advice in order to avoid aches, expense and time lost by neglecting their teeth.

If every dentist in the United States had in his office standard leaflets on the care and use of the teeth, including thorough mastication, the good which could be accomplished with millions of patients, and through them with tens of millions in their families, would be incalculable.

Dr. Smith—"The next speaker is one who has endeared himself to our profession by the interest he has taken in the etiology of that most troublesome disease commonly known as pyorrhea alveolaris. He is the first medical scientist, so far as I know, to give so much valuable time to the work of research in the field of dentistry. For this we love him. I present Professor Timothy Leary."

THE PROPER EXERCISE OF THE FUNCTIONS OF THE MOUTH AS A MEANS OF PREVENTING DISEASE.

The functions of the mouth may be divided into four:—

1. Mechanical—the breaking up of the food into fine particles and the grinding of the mass mixed with fluids into a paste for deglutition.

2. Physical-chemical—the mixture of the food mass with secretions, including the saliva, which tend to correct its variation in osmotic pressure.

3. Chemical—the aid to digestion through mixture with the salivary secretions.

4. The massing of food, by means of the sticky mucin into boluses for deglutition.

With the last two of these functions this paper will not deal. We shall endeavor to prove that the first two—the mechanical and physical-chemical—play an important part in reducing the danger of disease in at least three ways.

A. In eliminating in a considerable degree the danger of infection from external sources.

Before the days of bacteriology the distinction between infectious and contagious diseases was more marked than it is to-day. It was recognized that certain diseases, due apparently to a living infectious agent, were transmitted usually by direct contact with a diseased person, syphilis being perhaps the best example of this class—the contagious diseases.

A second class was thought to have a relationship, more or less remote, with the causes of disease, but the infection was believed to be largely air borne. Examples of this group were diphtheria, measles and smallpox, which were classed as infectious diseases which might also be contagious, i. e., due to direct contact.

The transmission of a third class of diseases was believed to be unrelated to previous cases of the disease, but was supposed to arise as the result of inhaling miasma of swamps, e. g., malaria. These diseases were known as miasmatic diseases.

The scientific study of the causes and manner of infection has eliminated the whole group of miasmatic diseases. Malaria was shown to be related to swamps because the water of swamps favored the growth of the mosquito carriers of the disease. It has been demonstrated that the inhalation of swamp air in mos-

quito-screened houses will not give rise to infection. With yellow fever, the demonstration that healthy human beings could sleep in the same rooms with yellow fever patients and even in their soiled beds or clothing, as long as the room was guarded from invasion by mosquitoes, determined forever the impossibility of infection by contact, which had up to that time been accepted as demonstrated with this disease.

The medical world has held, however, until recently, that with certain diseases of the second or infectious class, the possibility of distant infection through the air could not be ignored. With the exanthemata—scarlet fever, measles, chickenpox, smallpox—what appeared to be distant infections without contact with diseased individuals were constantly reported. In the face of this belief—compelled in part by lack of room and funds—certain of the hospitals of the city of Paris began to treat infectious diseases of this class in mixed wards. One bed contained a smallpox patient, the next a case of diphtheria, the next a case of measles, the next a case of chickenpox, and so on. The precautions taken consisted in separating the beds by partitions, usually of glass, which in some cases did not extend to the ceiling. The purpose of these partitions was not to isolate the patient, since the alcove for each patient opened widely into the open ward, but to remind nurses and attendants of the necessity of changing robes and disinfecting hands before passing from one case to another, and to permit of the thorough disinfection of each alcove as a unit when the patient occupying it was removed. The results of the treatment by this method, which is called that of “medical antisepsis,” are best seen in the reports by Dr. Louis Martin from the Pasteur Hospital. These show that out of 2,745 patients, including those suffering with smallpox, chickenpox, scarlet fever, diphtheria, measles and erysipelas, there arose in four years only eight transmissions of infection, five of smallpox, one of diphtheria, and two of erysipelas. These results indicate that air infection with this group of diseases, which were supposed to illustrate best the possibilities of air infection, is rare if it ever occurs. The small number of infections which arose could be produced by minimal breaks in the antisepsis.

In a valuable paper by Chapin (*Journal A. M. A.*, Dec. 12, 1908) the whole question of air infection is covered and the conclusions reached that air infection is of minor importance. With

many diseases of the respiratory tract, however, conveyance by the air must still be accepted as a frequent means of infection.

Air infection is synonymous with infection through the respiratory tract, where the entrance is through the nose. If we exclude the respiratory tract as *the* important atrium of infection we are compelled to conclude that the gastro-intestinal tract, with the mouth as its gateway, is the avenue through which most disease-producing bacteria make their way into the body. Second to this come the special groups of infections through the genito-urinary tract, the eyes and also wound infections, to which we shall not refer.

Specific evidence of mouth infection is furnished in all cases of typhoid fever, paratyphoid and the dysenteries, and the recent work by Calmette and others suggests that a large percentage of infections with the tubercle bacillus arises from material which reaches the intestinal tract through the mouth.

Most fatal cases of anthrax and a very large percentage of the cases of actinomycosis originate in relation to the mouth or other parts of the digestive tract.

The work of the French hospitals, which has been referred to, indicates that we must include in the class of infections through the mouth the exanthemata, smallpox, scarlet fever, measles and chickenpox, as well as diphtheria and erysipelas.

Through the mouth passes material in the form of food and drink which, if not originally contaminated, may become so through handling in its preparation or from contact with the hands of the individual while being conveyed to the mouth.

It is only within a few years that we have become acquainted with the bacillen-trager, the carrier of disease. It has long been recognized that in chronic diseases, such as tuberculosis and syphilis, the infected individual was, often for years, a source of danger to his neighbors, through the contamination of utensils and other materials by his secretions, most important of which was the sputum or saliva.

We now recognize that typhoid and diphtheria bacilli and the pneumococcus may be present for long periods, even many years, in the discharges of apparently healthy individuals who have recovered from acute attacks of the disease. Many epidemics of obscure origin, apparently air-borne, have been cleared up through the detection of such carriers as the intermediaries in the transmission of the infection.

Infectious material introduced into the mouth with food or drink meets with little resistance to its growth until it enters the stomach. The saliva is poor in antiseptic qualities, and as a matter of fact lacks them wholly in test tube experiments. The first real resistance to bacterial growth comes after food has reached the stomach, where the gastric juice comes into play.

Unfortunately for human kind, before the food reaches the oesophagus, it passes between the tonsils, which, in many human beings, offer ideal avenues for the entrance of bacteria. After passing the tonsils, the influence of the digestive juices of the stomach and duodenum are demonstrable. The value of the gastric juice in the destruction of bacteria depends upon two factors—its strength and its opportunity to come in contact with introduced bacteria.

Cushing and Livingood, in an exhaustive study of the bacteriology of the upper portion of the digestive tract, have demonstrated that the resting stomach and duodenum in man are free from bacteria, and that the maximal bacterial content is found after introduction of food. What is more important, they have shown that during digestion of a meal, as it is ordinarily introduced into the stomach, the gastric juice is wholly unable to cope with the great mass of bacteria introduced, so that food is passed on into the small intestines with only a diminution in the number of its bacteria. On the other hand, specific instances of the value of the gastric juice have repeatedly been reported. Anthrax bacilli introduced with fluid into the empty stomach of animals, at a time when the gastric juice is absent, are constantly recoverable from the feces, while the same organism introduced during digestion will be destroyed. An interesting epidemic of typhoid fever was reported some years ago from Germany. A company of soldiers was passing through a village in two squads. The first squad came to the village pump before mealtime and drank of the water. The second squad came through the village later, and drank after eating. Of the first squad, who drank before eating, i. e., on empty stomachs, a large percentage were infected with typhoid. In the second squad no typhoid appeared. It was later demonstrated that the water of the well was infected with typhoid bacilli. It should be said that fluids, notably water, are passed with great rapidity through the stomach and do not feel the influence of the gastric juice.

In Cushing's series it was shown that the stomach contents were free from bacteria immediately after digestion of an Ewald test breakfast. The only food article in this breakfast capable of contamination with bacteria to any considerable degree is a roll or equivalent quantity of bread, and it is emphasized that the bread should be thoroughly chewed.

Unfortunately there are lacking other observations in human beings of the difference in the anti-bacterial activity of the gastric juice as exhibited against well-masticated food substances, in contrast to food as ordinarily swallowed. Animal experiments are unsatisfactory. The dog, who bolts his food, is supplied with gastric juice many times the strength of the human juice, but is unable to destroy a large percentage of bacteria contained in the food. The herbivora, rabbits, for example, who more thoroughly masticate food, show a stomach content remarkably free from bacteria.

Clinical observation in man tends to establish the belief that thorough mastication, which results in a finely divided food mass, favors thorough mixture with the gastric juice and therefore enhances its activity.

B. The exclusion of an important source of putrefactive bacteria.

Within recent years much attention has been paid to the action of putrefactive bacteria on the body through toxic substances elaborated in the lower intestine. The essential facts which have appeared are these: that the large intestine in man is longer than it should be; that it serves as a storehouse for unused food products; that putrefactive bacteria find in the anaerobic conditions existing here and in the unused proteid residue ideal conditions for growth; that the putrefactive action of these organisms gives rise to soluble ferments which can produce marked toxic effects on the tissues of the body.

It has been supposed until recently that most of the putrefactive bacteria in the large intestine were taken directly into the intestine with food. Cultural work which we are carrying out suggests that the unclean mouth may serve as a storehouse from which a constant supply of these organisms is furnished to the intestinal tract. A mouth whose functions are properly exercised is a mouth which is kept clean—and a mouth which is kept clean is relatively free from anaerobic bacteria. An important source of putrefactive organisms can in this way be done away with.

C. In influencing the incidence of cancer of the gastro-intestinal tract.

Cancer of the stomach is notoriously a disease of gross feeders. Its alarming frequency in Germany and Austria illustrates this point. The part played by mechanical injury—traumatism—in the production of gastric ulcer has been demonstrated by Hemmeter. Mayo asserts that 80 per cent. of the cancers of the stomach arise on pre-existing ulcers, and his views are now generally accepted. A gross feeder overdistends his stomach—and frequent overdistention may result in injuries to the mucous membrane. Of more importance is the bolting of food. The mouth is lined by a mucosa intended to bear a certain amount of traumatism during mastication. The stomach, on the other hand, is lined by a delicate glandular mucosa which is readily injured by gross particles of food. Most of the injuries so produced are readily repaired, but repeated insults are apparently less well borne.

A second agency in the causation of cancer which is only now beginning to be appreciated is the influence of physical-chemical factors. Extreme variations in the osmotic pressure of the fluids which bathe mucous membranes I believe to be an important factor in the etiology of cancer.

Proper mastication of food corrects both of these dangers—gross particles of food are properly divided and the mixture of the mouth secretions with the food introduced will overcome extreme variations in osmotic pressure.

CONCLUSIONS.

Proper mastication of food in a mouth properly cared for is a valuable means of preventing disease.

1. By limiting the danger of infection through the gastro-intestinal tract—the important avenue of entrance of bacteria into the body.

2. By doing away with an important source of supply of putrefactive bacteria to the gastro-intestinal tract.

3. By eliminating physical-chemical traumata to the gastro-intestinal mucosa, which favor the causation of cancer.

Dr. Smith—"A large majority in all professions give little thought or time to matters outside of their daily practice. There are a few, however, who are never content with what is; they are

ever investigating into the domain of what ought to be and what shall be. The next speaker is one of the few who give of their ability and strength to just such work. He is an investigator of various problems, and has an intimate and speaking acquaintance with the bacteria of the mouth with their terrible names. He is well fitted to speak on the subject, "The Needs of a Dental Hygiene Council." I have the pleasure to introduce Dr. Samuel A. Hopkins.

Samuel A. Hopkins, M. D., D. D. S.—At the present time this movement in favor of dental hygiene is chasing the Council so hard that we are in great danger of being overcome and eaten up by it. The bear is at our heels and we are scared. We need help and we need it badly.

This movement did not depend upon any one man or one event. Long before there was a Dental Hygiene Council, many dentists here and in New York and in other parts of the country, had been preaching the need of a better appreciation of the importance of dental hygiene, and had been most anxious that the public school children and others should be instructed in the care of their teeth; also that means might be provided not only to educate, but to establish clinics to relieve pain and restore diseased teeth to their usefulness.

It was generally recognized that mental and physical efficiency in school children was greatly lowered by diseased conditions of the teeth and the success of the work of caring for the teeth of the school children in Germany had been noted.

Some attempt had been made in a small way to establish public clinics. Many of these have been of great service to the community. Examinations of the teeth of the public school children and watchful care of their mouths had been established in a few towns. In fact, everything that the Dental Hygiene Council has attempted had already been done; but because no central organization existed to combine all these needs and interests that work was necessarily restricted. A little over a year ago it was suggested that each dental society appoint two members to form this Council and it was done. The men appointed, however, were greatly at sea as to what was expected of them. Just how to begin and what to strive for was a question. The exhibit was first suggested and immediately there was a demand created for this forceful illustration of the evils resulting from diseased

teeth. We sent earnest speakers to tell the story wherever the exhibit went, and school teachers, mothers, physicians and dentists had their interest awakened in this subject. Then we got out some publications that were quickly taken up and distributed by the friends we had created and we went bankrupt trying to supply the demand. We tried to induce all the dentists in the State to join as associate members and pay a dollar apiece toward the movement, but I think we must have bungled that a little, for we did not get many responses. We were so hard up that we had to borrow the money to pay the postage on that venture and we did not get our bait back; scarcely a hundred responded. We still have faith in the Massachusetts dentists and we believe that ninety out of every hundred will be glad to send us a dollar or more, and that the other ten per cent. will only fail through inadvertence or carelessness. (It is a selfish thought, I would not utter it outside of this meeting, but such movements bring dentistry into dignified prominence and every honorable dentist in the State reaps the profit.) After this we published some more literature and still owe the printer for it, but he is a good kind printer and has not sent his devil after us yet.

We had more meetings and appointed sub-committees and among others a Conference Committee was appointed. At first the Conference Committee had no idea what was expected of it, but we decided to confer with some settlement workers and the heads of the various departments of charity and education. To my surprise they came to our meeting and they came with purpose and enthusiasm and they told us that they were glad to help the movement. Then with their help and advice and the endorsement of the Council we decided on these meetings and proceeded to make up the programme. We were bankrupt anyway and with the recklessness of the gambler we plunged ahead. The fact is that an interest had been aroused. People had become enthusiastic about this work. There was great pressure from all sides to push it. We could not rest without losing much that we had gained and it seemed to the Council that we simply had to go ahead or let the whole thing peter out. I believe we have done the right thing and I believe this will grow into a world movement.

There are, however, a few points which must be carefully guarded if this work grows as it should. I believe this movement

should not depend entirely upon the efforts of the dentists. What I mean is simply this, that no class of men engaged as we are in office practice can know thoroughly the social and educational problems involved in a movement like this. We can do the professional work, but we cannot know as well as those who have made a long study of public school matters, how to most effectively extend the work in this direction; nor can we know as well as those who do settlement work among the poor and those who are conducting charitable enterprises what the needs of the poor are and how best to supply their wants without pauperizing. We must seek out the educators and work through them and we must get the assistance of the various settlement houses and of the efficient workers in successful public and charitable institutions. We especially need the co-operation of all who deal with children.

We should make this work entirely impersonal. No dental school, no dental society or individual need expect to gain anything by this movement. It means the expenditure of time and money for anyone who touches it, and unless one is boiling over with a desire to promulgate the work and is willing to sacrifice his personal interests and take off his coat and work for the health and comfort of the children of this country, he had better make his subscription and keep out of it altogether. So far as the Dental Hygiene Council can arrange it there will be no wire pulling nor politics nor personal aggrandizement in this work.

In the enthusiasm awakened by this movement clinics are likely to be established and examination of the school children will be undertaken by dentists who may not care to work under the auspices of the Dental Hygiene Council. I wish I could insure all these enthusiasts of the Council's hearty support and I wish I could persuade them that we are anxious to encourage and assist their efforts. We don't care a rap whether the work is done through the Council or not as long as it is done well, but we realize that any mistake will seriously hamper the work of the Council and create a feeling of mistrust in the minds of the public. Therefore, I want to say now that if any examination of the teeth of children in any school or institutions is undertaken let me beseech you to carefully sterilize each instrument and your hands after each examination. Parents, teachers and even children know today what cleanliness is, even if they do not practice it, and if you don't use the most thorough means of sterilizing

your instruments it will kill this movement absolutely. The sterilizing should be an object lesson and make an impression on all who see the work done. The same methods should be applied to public clinics. Clean surroundings must be obtained, clean methods practiced or the harm done will far outweigh the good. If possible divorce your clinic from school or individuals and get them under the wing of some settlement house. You will then be sure to help the right people. Make a charge for every operation. Medical charities have been greatly abused and have done great harm, and it is the opinion of the settlement and social workers and the heads of our various charities that we ought not to begin our work by giving something for nothing. Such then are the needs of the Council. A better organization that shall have the confidence of the profession and through which all who are interested in Dental Hygiene will be glad to work.

We need the co-operation of physicians, teachers, nurses, mothers and all who have to do with the care of children. We need to conserve our forces and to thoroughly canvass each further step.

We need money to pay the expenses of this meeting and to extend the work. I should propose that every dentist who has not already done so, send a dollar to the treasurer and become an associate member. If possible send another dollar or two more. Remember every dollar helps to make public opinion and helps to prevent some child from suffering and disease. Moreover, won't you make a little canvass for us and try to see two other dentists who have not sent in their dollar, and urge them to subscribe? I think the public will come to our rescue when the work becomes known, but just now we must remember to look to our fraternity. The men from New York have been most generous and have sent on forty-five dollars for the work. Please don't let this matter drop.

To conclude, we need to make this movement as impersonal as possible. We need to maintain a spirit that will be above all petty strifes. We need a sustaining faith that will surmount all difficulties and rise superior to all discouraging influences; a faith that loses sight of the individual in the earnest endeavor to do God's work in improving the conditions of his children. And for this we need your support.

THE NEW YORK INSTITUTE OF STOMOTALOGY.

A regular meeting of the Institute was held Tuesday evening, December 1, 1908, at the Academy of Medicine, No. 17 West Forty-third Street, New York City.

The President, Dr. Charles O. Kimball, occupied the chair.

The Secretary read the minutes of the last meeting, which were approved.

Dr. Leo Green—I move that the society empower the chair to appoint a committee of two to examine the Tuberculosis Exhibit now being held in the Museum of Natural History in this city, and report at a subsequent meeting.

The motion was carried.

The President appointed Drs. Leo Green and Arthur L. Swift.

Dr. S. E. Davenport read a paper entitled, "Humane Methods of Wedging."

(For Dr. Davenport's paper, see page 23.)

DISCUSSION ON DR. DAVENPORT'S PAPER.

Dr. K. C. Smith—In do not think I shall be able to add much to what the essayist has said, because my practice has been very similar, but on some points I may elaborate a little. He says that tape may be saturated with wax or other material, but he does not state what the other material is. In my hands it is sandarac varnish, for two reasons—it prevents absorption of moisture to an extent and materially aids in holding the tape in place, and when used on the thread it holds the knot very securely. Many times I have used tape in connection with the thread instead of cotton, either tying the thread around the tape, or better still, slipping the tape through the thread by untwisting the latter sufficiently to pass the tape through, then cutting off the ends after the thread has been tied. The latter method holds the tape more securely. The glazed thin tape of linen and cotton mixed I have used for a long time and very satisfactorily.

The essayist has neglected to speak of a class of cases sometimes requiring wedging—namely, bicuspid and molars having large approximal cavities, making the spaces open at the occlusal portion and tight at the gingival margin, just the opposite of those cases designated by him as belonging to Class II. These may be

nicely managed by tying a piece of the wedging thread around a small roll of rubber dam, which is then cut to the required length and placed in the cavity. The ends of the thread are then passed through the gingival space in opposite directions, around the roll of rubber once or twice, and then tied precisely as though the roll of rubber were the normal knuckle of the tooth.

Dr. Davenport in his directions for tying the wedging material neglected to say that the loop, after being pulled between the teeth may be twisted several times before passing the end through, adding very much to the wedging force exerted and lessening the liability of the material pulling by the knuckle on being tied tightly. In the case of incisors where there is an approximal cavity, a simple knot on the ligature suitable to the size of the cavity, and made to pull into it on tightening the same, will accomplish better results in many cases than the method described by the essayist. Slipping of the knot before the second half has been tied may be prevented by making the first half of the square knot really a double knot, such as we use so often in tying the rubber dam in place.

Dr. C. Frank Bliven—It should be a source of great gratification to The New York Institute of Stomatology that Dr. Davenport has given this valuable paper before it. Dr. Davenport should be congratulated in that he recognizes the vital interest this subject demands. I hope it will be published in some of our leading journals with the addition of any valuable points brought out by discussion.

This paper shows a human interest in the comfort and welfare of the public, and is worthy of emulation by the entire profession.

With the numerous methods at our command there is no excuse for undue suffering when the suitable method is selected.

The position taken by Dr. Davenport in his paper leaves little, if any, opportunity for discussion.

I cannot entirely agree, however, with the writer that those teeth he enumerates as belonging to the second class, or bell-shaped, are the most difficult to separate painlessly, for these bell-shaped teeth, with their constricted necks need the least separating, because of the increasing space between them as the gum is approached. This condition frequently gives ample room to operate by using instantaneous methods.

The inverted bell-shaped teeth have their contact point at the gum, usually a broad one. If the cavities are small they are situated beneath the gum, and are among the most trying to fill, requiring ample space to reach them. Even the larger cavities approaching near, or including the coronal aspect, require much more space than the bell-shaped. It is quite a problem to deal with these cases without encroaching upon the gum to some extent, with attendant discomfort.

There is a type of teeth that may be called block-shaped, having large parallel contact which is ideal to separate, and amenable to almost any method that may be employed.

Dr. Davenport's description of different methods is very clear and concise, but he has omitted several that, it seems to me, are too important to be overlooked.

The bell-shaped teeth, when the cavities are small, may easily be separated by placing a ball of crude cotton between the teeth, tying it securely in position, then saturating the cotton and surrounding surfaces with sandarac varnish, keeping it dry until the varnish has time to set. This may also be accomplished by using "Humane Separating Tape," and burnishing with a warm ball or egg-shaped burnisher. One or two applications of this tape is all that is necessary to gain the needed space, for the width between these teeth at the gum line renders the cervical margin easy of access.

In Class One, or inverted bell-shape, space may be obtained by either the tape, or by ligating, but there will always be more or less discomfort experienced during the process.

When cavities are large the problem is much simplified. Crude cotton may be packed tightly in the cavities, and saturated with sandarac varnish, keeping it dry for a few minutes, or the decay may be removed if the coronal aspect is encroached upon in one or both teeth, and the space securely packed with base plate gutta percha, and left for several weeks.

By this method, in mouths where a large cavity in a molar has permitted one-third or one-half of the bicuspid to enter the cavity of the molar, I have been able to obtain one-eighth of an inch space at this point.

Dr. Davenport calls attention to the objection of the use of absorbent cotton. If he will supplant this with crude cotton, which contains the natural oil, and is antiseptic, and saturates it with sandarac varnish, his objection will be overcome.

Japanese grass line may be obtained in any city where fishing tackle is sold, and comes in fifty-foot lengths, at an expense of fifty cents. With judicious use at least one hundred separations may be made with this length and one-half cent per separation ought not to be prohibitive, even in a country practice. Every countryman at some time comes to the city, and ought to be able to obtain a sufficient supply before returning, if he makes his purchase early in his visit.

Tape impregnated with wax and thyme soon becomes foul in many mouths, and led me to experiment with other materials. The red tape I found to be more satisfactory than the white, but not so aesthetic for use in the anterior teeth. In mouths where the fluids are normal, almost any preparation will remain free from offence, but in others it will be extremely difficult, until a more harmonious systematic condition is attained.

The Perry Separators, which Dr. Davenport has not mentioned and may have overlooked (for I cannot believe he is not familiar with them) is one of the most valuable appliances a dentist can possess. I am unable to conceive a successful operation performed without them, in ninety-nine per cent. of the cases we are called upon to treat.

After the separation has been obtained, some method must be employed to keep the teeth apart during the operation. When properly applied, this is a humane method.

The arms should be supported by packing under them a mixture of wax and base plate gutta percha to protect the gums from the encroachment of the jaws, and render them steady during the operation. This method is the only way the cervical margin can be properly excavated beyond the border line of danger, as recommended by me twenty-five years ago, and recorded by Dr. Taylor, of Hartford.

When the diseased structure does not encroach upon the gum line, the orange wood wedge may sometimes be used successfully. Any method which appeals to the humanitarian, that accomplishes the desired result, is of value, and should be accepted without prejudice.

I hope the valuable points given in Dr. Davenport's paper and those brought out in its discussion, will attract the attention of all dentists, that the suffering of the public attendant upon obsolete methods may be entirely eliminated.

Dr. K. C. Smith—There are two points I forgot to speak of, two questions I would like to ask. Has anyone here ever used or heard of sea tangle tent for wedging? It has been suggested as a very excellent material in cases where there are large cavities into which it can be packed. This sea tangle tent is the material used by obstetricians.

I would like to ask the essayist how he came to the conclusion that the linen thread did not swell; because after having placed it in water for twenty-four hours myself, while I am unable to state that the length was any less, I have found the circumference was at least two or three times greater.

Another reason why I am under the impression that the linen is preferable to the cotton thread in many cases, is that it is very much stronger and can be tied with greater force.

Dr. MacNaughton—Dr. Bliven spoke of using gutta percha to wedge and leaving it five or six weeks. I have used gelatine treated with formalin for separating where there is a cavity. It can go for one or two days or longer. Treating the gelatine with formalin makes it insoluble.

Dr. Wheeler—Dr. Smith spoke of the tent of sea tangle. I used that for many years. It was spoken of by Dr. Guilford, of Philadelphia, at a meeting where I was present. It is a compressed mass of sea tangle, which can be cut to the required size. It swells and has a consistency not unlike the gelatine Dr. MacNaughton spoke of. It is remarkably good for separating, and not so hard or harsh as to cause pain unless it impinges on the gum. The elastic conditions remain for several days, so that it will continue to work for some time after being put in.

For many years before I learned of the fishline method spoken of by Dr. Davenport I used sea tangle tent, and often succeeded in those cases of V-shaped orifice by first starting the separation with rubber and then making a wedge of sea tangle, the same as we would of orange wood. That worked very well, except it was liable, if the patient struck it hard, and it happened to extend above the tooth, to be pushed out. But in cases of approximating cavities I do not know anything better than sea tangle tent.

Dr. H. Griffen Marshall—Dr. Davenport and I fought this out some years ago before this society. I think it is some twenty years since I have abandoned rubber for separating. I have

never gone to Paris for fishline, but I have used almost everything of the cord description, practically the same as he described, years ago, placing it between the teeth in the same way. I think Dr. Davenport got the use of the knot from me, because he did not know it at the time we had the discussion. In those cases that failed, it was from using too much cotton. Twenty-four hours usually will separate sufficiently to fill ordinary cavities. If more space is needed, other and heavier wedges must be put in, but the peculiarity of this method, which is certainly humane, is that I never have any soreness to interfere. Only occasionally will the patient complain of any soreness at all. The same space can be gained in the same time as with rubber, but the rubber would make the teeth very sore.

Dr. Merritt—Something that has proved very satisfactory to me in Class II cases is the ligature silk put out by John D. Cutter—now used extensively in orthodontia, sizes 1, 2 and 3. It is charged with gutta percha. It is painless and cleanly. I am told by those who know that the shrinking properties will continue for two months, and a very considerable space can be secured in a comparatively short time. Coming in three sizes, it can be adapted to any case of that kind which presents itself.

The President—The line Dr. Davenport spoke of is pure silk, and comes from an establishment in Paris that deals exclusively in silk. It is not expensive when bought in quantities. For some years I had to trust to the kindness of Dr. Bogue and Dr. Davenport to get it for me, but last year when I went over there, I got a great bundle of it which will last me the rest of my lifetime and my son after me, I think. It is put up very elegantly and in different sizes, so one can order by number.

I am surprised that Dr. Davenport speaks against the use of wood, as I should be sorry to be without orange wood sticks in wedging. I am speaking now for the interest of the patient, too. I have patients who, after using the tape some time, ask me for wooden wedges. They think it cleaner and sweeter. When not content with the tiny separations that some of my friends are, I find, after separating the teeth with the silk ligature, I can do better for myself and for the patient by falling back on wooden wedges, but, of course, keeping clear of the gum.

I can give my personal testimony that the silk ligature is extremely valuable, tied in the way Dr. Davenport describes. If

a very thin cord is used at first, it can be increased to a certain size; but beyond that, I feel I must have a bit of wood, and my patient usually prefers it.

I do not see how Dr. Davenport can get the necessary strength with the cotton cord. It breaks so easily.

I should also criticise the use of a piece six inches long. It irritates me to have my secretary cut off a piece only six inches long. I prefer to have it twelve inches long so as to have six inches on each side to tie with.

Dr. W. D. Tracy—I hoped someone would furnish testimony concerning the use of Dr. Bliven's cotton tape, which is impregnated with gutta percha. I have been using it for a year wherever a tape wedge has been indicated, and it has been a great comfort to me and to the patients.

Instead of trying to cut it with scissors, I take a No. 4 lancet of the S. S. White make, cut it off, and with a warm bur-nisher I pat it and pack it close to the knuckling point. It stays well and causes very little soreness. I do not see why it should be less painful than the unprepared tape, but perhaps it swells more slowly. Sometimes where the tape cannot be gotten in, the teeth can be separated momentarily with the Perry or other separator and the tape then put in.

Dr. Davenport—Possibly I owe an apology to Dr. Karl Smith for stating that the Irish flax or carpet thread does not swell. I tested it a number of times, and the length of the piece after twenty-four and forty-eight hours was always exactly the same as before the soaking. In my experiments with various wedging stuffs in the mouth, as well as out, the materials which did not shorten when wet produced no appreciable amount of separation; therefore my conclusion concerning the Irish flax.

This fishline method may be used to illustrate the whole coterie of line wedges. The wedge when tied is a circle. Therefore when the material, moist, has not shortened—has not, in other words, decreased the circumference of that circle—it is not as helpful and does not wedge as much or for as many hours, as the material which, when wet, makes a smaller circle. Regarding the President's loyalty to wood, I am sure the orange wood wedge would be useful and humane when placed between teeth of Class One by careful operators of good judgment like Dr. Kim-

ball, but it would be dangerous to use the method in teeth of Class Two.

I have listened with great pleasure to the discussion of my friend, Dr. Bliven, who is an expert on this important subject of the humane wedging of teeth.

The President read a communication from the Executive Committee of the Metropolitan District of the Massachusetts Dental Society, inviting members of the Institute to attend a meeting of the Allied Societies to be held at the Boston City Club Saturday evening, January 16th, 1909.

Dr. Davenport moved that the invitation be accepted with the thanks of the Institute. Carried unanimously.

The President—Before asking Dr. Head to demonstrate the use of his tartar solvent, I will call upon him for information concerning the Thomas W. Evans fund.

Dr. Joseph Head—The question of the Thomas W. Evans bequest has interested the dentists of Philadelphia ever since he died, some eight or nine years ago. Dr. Evans left about four or five million dollars. A certain amount of this he left to his heirs with the proviso that it should be used for the founding of a museum and dental institute.

The dentists of Philadelphia and Pennsylvania have been endeavoring, ever since Dr. Evans' death, to get information on the subject, but have always been told that the subject was not ripe for action. We waited and then a vague rumor got about that there had been so much litigation and unwise expenditure that there was not much left of the fund. For instance, one executor, we are told, had published the life of Thomas W. Evans according to the will, had published only twelve copies of it and had sent in a bill to the estate for \$100,000, which bill was paid. That man is at present in France, having taken out French citizenship, and I am creditably informed that if he ever puts his foot on this soil, he will be arrested.

Many curious complications arose. We never understood why no dentists were consulted on the question. Finally we learned that when Dr. Evans died, the residue which he had left for the founding of a dental school was about three million dollars, but unfortunately in dying he had not founded the school, and so Mayor Ashbridge, according to the power given him by the will, formed a society known as the Thomas W. Evans

Museum and Dental Institute Society, composed of thirteen members. He chose admirable men of Philadelphia, prominent lawyers and business men, but there were no dentists. However, there was one dental institution represented on that board—the University of Pennsylvania. Two trustees of that university were made trustees of the Thomas W. Evans Museum and Dental Institute Society.

Nobody could get any information on the subject, but last Spring I happened to have as a patient, a lawyer named Hughey, whose father had been the lawyer of many of the heirs, and who knew the subject from beginning to end. Having talked it over with my friends in Philadelphia, we thought if we could get that fund to found a post-graduate school where all dentists could come and study on a basis of equality, it would be one of the greatest things that has happened in dentistry for many years. Although the fund had dwindled to a million or two, various deans of colleges, who have had experience in such matters, assured us that sum would be ample, especially as the founding of a post-graduate school would be less expensive than an undergraduate school, since a great many of the rudimentary things would be done away with and only advanced principles taught.

Just as we were talking this matter over, I was met by one of my friends, who asked me to work for the University of Pennsylvania in the matter. He said to me: "You are a University man; why don't you work for it?" I said: "True, but I am first and foremost a dentist, and I propose to work for what I consider the best good of dentistry."

He afterwards told me he had been working quietly for three years to get that bequest for the University, and that others had been doing the same thing. Finally we found out that a regular proposition had been made the Thomas W. Evans Society trustees that the fund should be given to the University, and last May I was told by the President of the Board that everything had been so arranged that unless letters of protest from prominent dentists from Philadelphia were given to him, the fund would be given to the University of Pennsylvania. Whereupon we promised that protest should be made. A meeting of the dentists of Philadelphia was held and resolutions in favor of an independent post-graduate school were passed and sent to the trustees of the fund. These resolutions and the societies and col-

leges represented among the signers may be found in an editorial of the September, 1908, "Journal of the Allied Societies," beginning on page 203.

The University of Pennsylvania refused to join in presenting these resolutions to the trustees of the Evans fund, having already made a proposition favoring the use of the fund for extending the work of the University.

We are a branch of medicine having a section in the American Medical Association, and therefore it would be perfectly feasible under this will for us to found a school of special medicine in the form of a post-graduate school of dentistry, just as the polyclinic school of medicine is founded for post-graduate instruction in medicine. It has been so frequently reiterated by the partisans of the University of Pennsylvania that it must be an under-graduate school that I wish to emphasize the point that we have absolute assurance from the best legal minds in Philadelphia that the powers of the trustees of the Thomas W. Evans Museum and Dental Institute Society can give us either an under-graduate or a post-graduate school.

Therefore we are asking societies all over the country to send in resolutions expressing their approbation of a post-graduate school. All New England practically has sent in such resolutions, New York is coming to the front, and Chicago and the Allied Societies of Illinois are sending in resolutions favoring a post-graduate school, I am informed that many who were in favor of giving it to the University are now on our side. If the dentists of the United States wish a post-graduate school, and will express their desires and opinions through suitable resolutions, there is no doubt but that the Evans fund will be used for that purpose and all will be able to study on a basis of equality.

The President—This is so important a subject, and so timely, that it seemed wise to interrupt the regular course of our proceedings to have this full explanation. There can be no question in the minds of any thoughtful dentist that the great need at the present time in dental education is a post-graduate school of high character. Shall we take any action upon this matter?

Dr. E. A. Bogue—I move you, sir, that The New York Institute of Stomatology resolve that the plan just proposed by Dr. Head meets with our hearty approval and commendation, and that we petition the trustees of the Evans Fund to grant the request made to them by the dentists of Philadelphia.

The motion was carried, and Drs. Bogue and Davenport were authorized to prepare the resolution in accordance with such action, and send to the trustees. The following is a copy:

To the Trustees of the Thomas W. Evans Museum and Dental Institute Society:

GENTLEMEN:—The New York Institute of Stomatology, at its regular meeting, held Tuesday evening, December 1st, 1908, at the New York Academy of Medicine, passed, unanimously, the following:

RESOLVED, That the Institute heartily approves the resolutions presented to your honorable board by the dentists of Philadelphia in May, 1908, favoring the use of the Thomas W. Evans fund for the establishment of a post-graduate school, independent of any under-graduate school, and open to any reputable practitioner of dentistry.

If within its province the Institute would respectfully urge the use of the Thomas W. Evans fund for this purpose.

The President—Dr. Head will now kindly demonstrate to us the use of his new tartar solvent.

Dr. Joseph Head—For a number of years I have been much interested in the erosion of the teeth, and tried a series of experiments concerning the dissolution of the enamel by acids and the speeds at which they would do it.

One evening I dropped a tooth covered with tartar into commercial hydrofluoric acid, desiring to see how much of the tooth would be left in the morning. When I returned my surprise was great to find that all the tartar had been dissolved, and the tooth untouched. I was not then able to explain it, and cannot now. Tartar is largely composed of carbonate and phosphate of calcium, and the tooth structure is largely carbonate and phosphate of calcium, with perhaps one or two per cent. of fluoride of calcium. Some may shake their heads and say that the fluoride of calcium is the reason, but that does not explain why the internal atoms and molecules of the tooth should resist the action of the hydrofluoric acid, and why the molecules of tartar will not.

You can take a diamond, which is pure carbon, heat it red-hot, and solder it with hard solder without hurting it. Do that to a piece of charcoal, and it will rapidly disappear, although both are pure carbon.

For one or two of my patients whom I knew very well, I used a little pure hydrofluoric acid. The first one nearly coughed her head off, and received a bad burn. Although it was a good thing for tartar out of the mouth, it did not seem to be good for the tissues in the mouth. I will not burden you with a report of my experiments but I finally came to a mixture of bi-fluoride of ammonium so bland that it could be poured on the skin, but which will etch glass and will dissolve tartar without injuring the tooth. I made this chemical discovery and the next thing was to work out its therapeutic value. For about a year and a half I tested this substance and by some good luck which does not happen often to me in my experimenting, all the incidental factors that ordinarily go wrong, have gone the right way, and as a matter of fact, the present solvent is more powerful when put in the mouth around the tooth, than it is in a glass outside the mouth.

I take a rubber, platinum-pointed syringe, and being careful to put cotton on each side of the gum to protect the mucus membrane, I inject the solvent to the bottom of the pockets, allowing it to stay there for about two minutes. There will be a slight itching and blanching of the soft part, and perhaps a little pain, although in some cases none. At the end of two minutes I let the patient rinse the mouth and send him away. The next time the tartar that was there will have become very soft and it can probably be scooped out. The second time all but the microscopic bits can be removed and the third time the gum will be stimulated and caused to re-adhere to the tooth. I have had wonderful success with it and those who have tried it and followed my directions have had similar success. I cannot help feeling that properly used this will be one of the great boons in dentistry.

If this solvent is allowed to dry in large quantities on the outside of the gum, it will cause a burn like carbolic acid, but if all excess is immediately wiped away there will be no harmful effects.

Teeth so loose that I have been able to move them back and forth have, by an application of this solvent twice a week, been tightened in position in a couple of months.

Yesterday I saw a patient with a left lower central incisor which had been weeping pus for the last six years, though he had had all manner of treatment. I said: "I think I can guarantee that in two weeks there will be no more puss." He said if I did that, I

would be doing more than he believed possible. I made one application, and when I asked him if he had had any more pus he said he was not sure. I made another application and he said: "Doctor, I cannot get any pus at all now." I made the next application yesterday, and I had difficulty in getting the point of the syringe down in the pocket, but I got blood.

It was a quick case of recovery and the gum was starting to re-adhere to the tooth. I do not say that we will always get healing of the pockets with this solvent, but I can count the successes by the hundreds. It is so valuable to me that I feel I am almost in a dream when I tell you about it. I do hope you will all get as good results with it as I have.

I read a paper on this subject at the National Association last summer, describing exactly how I made it. It is made as follows: Take the hydrofluoric acid and neutralize it with carbonate of ammonium. Filter it and evaporate the solution to half its bulk. Fill up to the original bulk with the acid solution and evaporate once more to half its bulk. If it is not properly done, it crystalizes, and there is free acid which is very irritating. I had difficulty in getting people to make it. Several firms tried it and some tried to improve it for me. I thought it was rather improbable that they in two or three days could improve what it had taken me years to work out.

I am making arrangements with Mr. Adamson, of Baker & Adamson, Easton, Pa., to make it. He tells me that he will reproduce this solution up to 1/100 of one per cent. of its acidity. That will be satisfactory, and I hope within a month or so all may get a supply of it. If anyone does not understand how to apply it, if he will come to Philadelphia, I shall be glad to show him how to do it—and this is a real invitation.

The President—When Dr. Head brought this solvent before the National Association last summer, it was criticised by some who thought they knew more about hydrofluoric acid than he did, but the solution was tested by a committee, and found, as stated. We cannot realize at once what this means to us, but if it be true, as Dr. Head states it, and I see no reason to doubt it—does it not seem as though we were at the beginning of the rational and exact attack upon what is to us the greatest danger of all—pyorrhea? All the various schemes for treating pyorrhea depend for success upon the great care with which the tartar is removed. This

dissolves that which cannot be reached. It seems to me we owe Dr. Head an immense debt of gratitude for bringing us face to face with the solution of one of the most difficult problems we have in modern dentistry.

Dr. Merritt—As one of the committee appointed by the National Association in Boston to investigate the claims made by Dr. Head, I may say that every contention made by him was fully borne out by the investigations of that committee, so far as it was possible outside of the mouth. The solution had a solvent action upon the tartar on the roots of the teeth that was little less than miraculous, and yet had no effect on the tooth. When one realizes the difficulty of removing these particles by instruments, and that it is only when they are removed completely and the root left smooth and polished that we can expect anything like good results then only can we appreciate the value of the drug which Dr. Head has told us about tonight.

Dr. R. G. Hutchinson, Jr.—I am delighted to have been present tonight for I was unable to attend the meeting of the National Association last summer and had not heard of Dr. Head's discovery. It seems as though we were approaching the millennium when we can apply a chemical agent which will act on tartar and not injure the tooth. I take it that Dr. Head does not intend that it shall be used for the removal of all deposits—the bulky deposits around the necks of the teeth and where a considerable amount would have to be applied.

It appears to me to be an adjunct to instrumentation. We know that the flow of pus can be stopped and a restoration to health established quickly in accessible places by the use of instruments. Such an application as this would be useful in pockets inaccessible to instruments where we cannot reach the point of suppuration. There are some conditions of pyorrhea where we have removed the deposits and yet we cannot retain the tooth. Nothing would make it tolerable to the tissues, and it must be removed; Nature is exfoliating it.

It would be a mistake for the profession at large to think that in this they have a panacea that can be used indiscriminately—that even a child could use. We must not overestimate its value, rush ahead, and then because we fail, condemn it. Let us be careful and apply it in cases where good judgment says it is called for, but we should not abandon the instruments. In

the bifurcation of molar teeth, and places which we cannot reach with instruments, I should think this preparation would be most valuable.

Dr. William B. Dunning—I was also on the committee in Boston to examine this preparation, and I think it would be interesting to refer to certain particulars which Dr. Merritt did not mention. We made the experiment with hydrofluoric acid, and also with the ammonium bifluoride. In examining a freshly extracted tooth covered with hard tartar some six hours after immersion in Dr. Head's preparation, the tartar was removed and had fallen to the bottom of the pan. Some particles remained, but could be removed with the finger nail. The enamel was highly polished, the cementum was unchanged, but there was a slight change in the exposed dentine. This was after six hours, which is, of course, a much longer test than could be made in the mouth. Dr. Head tells me the effect on dentine is a negligible factor in its use. He says it makes no material difference; but it should be mentioned, as this is a matter of scientific interest.

As I remember, the tartar was reduced to a soft, cheese-like mass. It was not dissipated, and the term solvent may not exactly describe the action of the compound; perhaps the word "disintegrant"—I am not sure that such a word exists—might more accurately indicate the effect of its application. The tartar is disintegrated and in a condition to be washed away.

I would like to ask Dr. Head whether the tartar in the pocket is to be reduced to this soft mass and removed with the instrument or syringed out, or whether the tartar, having been reduced to this soft mass, is later by some physiological process absorbed or otherwise removed.

Dr. Head—I am glad Dr. Hutchinson brought out the points he did. I did not wish to reiterate too much, but in my paper I said all the skill one had for the treatment of pyorrhea would come into play—that instrumentation was to be considered of prime importance. I agree with everything he said about taking off the tartar with instruments, but I do say that this solvent properly used where one cannot do anything else, will absolutely cause the tartar to disappear in time. For instance, a patient recently said to me concerning a weak molar: "Doctor, every time I bite on that tooth I get a disagreeable taste, and I feel it is not clean underneath." I made an application three days in suc-

cession, and she said the disagreeable taste had disappeared, and that the tooth was comfortable. Whether I hypnotized her or not, I do not know; but that is what she told me, and if we can have a material by which we can hypnotize our patients, we should use it.

I know of another case in which there was a constant flow of pus between the second molar and the wisdom tooth. With instruments I got a great deal of tartar out, but I felt there was tartar that could not be reached down near the end of the roots. The soft parts were so sore when the patient first came he thought he was getting an abscess. After three application of the solvent the soreness disappeared and the gum assumed a normal condition. I could still get pus, but that was about two months ago. He came to me a couple of times a week, and there is now no pus, and the tooth is comfortable. The last time I treated him I got blood from apparently the adhesion of the gum to the tooth. I had no X-ray and cannot tell whether the tartar is there or not, but if it is, the tooth is fooled, and does not act as though it was there.

In treating these pockets, I have sometimes injected it into the canal of a tooth, so that it came through the pocket on the outside. So long as it is confined to the inside of the pocket and under the mucus membrane there will be very little irritation. There may be some pain for ten or fifteen minutes, but the patient will invariably say on the next visit that the tooth seems better.

Dr. Dunning asked me to speak of that cheesy part of the tartar that was left when the solution had expended its force. I can only say where that can be reached with the scaler it will be better to remove it. It will come off very easily. I believe that this solution acts in two ways—it dissolves the tartar and stimulates the cells of the peridental membrane. I think it dissolves the microscopic particles of tartar that may be deposited in the peridental membrane, and in that way causes healing. I remember a case four months ago, where the tooth was so loose that I would have taken it out if it had not been for this solvent. The patient came in twice a week, and now the tooth has become firm enough to chew on, and I think it will become absolutely firm. The solvent stimulates the cells in the peridental membrane so that they will eat up the tartar just as the cells in cer-

tain kinds of stimulation will eat up the root. In one case it is a stimulation to destruction, and in the other a stimulation to restoration of health.

Properly injected twice a week to the tip of the roots and allowed to stay there for two minutes, and the mouth rinsed—cases that would be otherwise hopeless will nine times out of ten get well.

The President—Does Dr. Head use the gold or the platinum syringe point?

Dr. Head—It makes no difference. I generally use the platinum.

The President—Is the solution used full strength or diluted?

Dr. Head—Full strength. The addition of water destroys its value.

The President—How much is injected at a time?

Dr. Head—I fill the pocket full. If any excess gets on the gum, it must be wiped off.

Dr. Merritt—Does it deteriorate?

Dr. Head—No; properly made, it will improve. It will be less irritating. Some solutions I made six months ago are a little blander and still as effective.

Dr. K. C. Smith—What kind of a bottle should it be kept in?

Dr. Head—Gutta percha or wax. If the bottle is pure gutta percha, it is all right, but if not the wax bottle is better.

Dr. Tracy—What is the chemical name?

Dr. Head—Bi-fluoride of ammonium.

Adjourned.

CORRECTION.

The formula for the paraffin root filling, in Dr. W. B. Dunning's article in the Journal for December, 1908, p. 294, was given as follows:

Melted paraffin	3viii
Paraform	3viii
Zinc Oxide.....	3iv
<i>This should have been:</i>	
Melted paraffin	3viii
Paraform	3i
Zinc Oxide.....	3iv

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A regular meeting of the Institute was held Tuesday evening, January 5th, 1909, at the Academy of Medicine, No. 17 West Forty-third street, New York City. The President, Dr. Charles O. Kimball, called the meeting to order.

The Secretary read a communication from the Cleveland Dental Society, extending fraternal greetings to the Institute, through their Vice-President, Dr. Ebersole, the essayist of the evening.

Dr. Merritt moved that the Secretary be instructed to express to the Cleveland Dental Society the Institute's appreciation of their good wishes and cordial reciprocation of the same. The motion was carried.

The President.—We are glad to welcome our friend, Dr. Ebersole, of Cleveland. What he said before the National Dental Association last summer made an impression upon those who were there and we are glad to hear his message before our association.

Dr. William G. Ebersole.—Mr. President and gentlemen, to be asked to make an address before this body is in itself a very decided honor, because as I understand from inquiry, this is supposed to be the most exclusive dental organization known to the world at the present time.

To have the opportunity to be the bearer of a message from my own beloved society, to this organization is also an honor and a privilege.

The paper which I have to present to you has a subject a little different from that published in your programme. "A Plea for More Humanitarian Methods in Dentistry, With Suggestions for Producing the Same."

(For Dr. Ebersole's paper, see page 9.)

DISCUSSION OF DR. EBERSOLE'S PAPER.

The President.—Dr. Charles S. Stockton will open the discussion.

Dr. Stockton.—I am glad to have had the pleasure of listening to this delightful paper.

We all need just such an awakening as this.

We know it all—have known it for years, but our strenuous

lives are such that, while we do not forget, yet in our haste we do the things we should not do, and leave undone the things we should do.

Hundreds of thousands of teeth are lost every year simply because our patients dislike to give the time to have the work done, and dread the pain.

We say to our patients, let me see you in six months. It may be a year, or more, before we again see them, and then only because the throb of an aching tooth reminds them that the promised visit can no longer be postponed. It is a dread of the pain incident to the operation, that has kept them away, so any suggestion that can come to us, that shall eliminate this fear of pain, is indeed a welcome one.

We are co-laborers with God in the human frame. He conceiving and erecting, we preserving against untimely ruin and repairing the broken places. And not only the saving of an organ is under consideration, but the amelioration of pain—to give a quietus to acute suffering—to act the part of saviors to society in this respect, has something almost divine in it. We sometimes affect to disparage the pain, which proceeds from inferior parts. We do not respect the protest of a tooth nerve as much as a twinge at the heart strings, but it makes the imperious soul, that would ignore it, attend.

While happiness may not be the end of life, nor the test of virtue, yet the pursuit of it is noble and engrosses us all, and it may sometimes be chased down and captured in a dental chair. A tooth root may become the root of all evil for the time and its extraction operate like the eradication of original sin. We are not the creators of literature, but we could never have had "Paradise Lost," "In Memoriam," nor could Gladstone or Stanley have made parliament ring, if their teeth had not been in good order.

No truer statement than this from the paper just read can be put before us:

"For is it not true that the diseases which the dentist is called upon to treat are the most prevalent known to the human family, and is it not also true that so long as these diseases exist and their effect are felt, both directly and indirectly, upon the physical being, that being cannot approach perfection, mentally and physically. These diseases begin with life and end

only in death. All along the line of life the trouble runs, the infant on its mother's breast, crying with pain incident to the eruption of the first set; the decay and pain of this set; the decay and pain of the second set and their final loss. So pain is our mother of sorrow all along the line from the cradle to the grave."

Where is the remedy and how can we reach it? The doctor truly says the experience of the past is the curse of the present.

The dread of the dentist must be overcome.

Let me recite a little personal experience. I thought I had a decayed tooth, but was not sure of it and had a fellow-dentist examine it. After he had "jammed" his probe into it, I was absolutely sure of it, because the pain went, not only to the tooth, but all over my being. I resolved then he would not fill that tooth.

A short time after I visited a New York dentist to have it filled. The first thing he did was to put on the rubber, then he used the separator and the tooth to be filled was the one that moved, so was very sore. The operation took about an hour and a quarter and when it was over I made the ungracious remark that if I thought I hurt my patients as much as that I would give up practice and sell peanuts on the corner. The tooth never recovered from the severe separation and the long malleting, and I lost it.

Both these gentlemen needed just such a lesson as this paper offers.

A lady patient came into my hands from another practitioner. She had just had her teeth put in order and the work was splendidly done; not a fault could be found with it, but the patient was a wreck and a fit subject for a sanitarium. She was pregnant, and naturally in a nervous condition, and her teeth very sensitive. It happened that she split a corner from one of her molars and it gave her great pain whenever she used it, but the dentist who had so beautifully filled her teeth could not find the cause of the pain. It was almost impossible for the patient to control herself, and her relatives and friends thought the woman was going insane simply because her dentist had done such a large quantity of work and worn her out. Had he temporized and waited until after her recovery from the confinement she would have been his loving patient, as she is mine today.

The dread of the dentist must be overcome.

I approve of all the doctor says about the remedies used; they are all right.

I could not practice my profession with the humanitarian feelings I have without my every day remedy, "anaecoligen." With it I can do my work almost painlessly, as any dentist should. Gain your patient's confidence, dispel fear, be truthful.

When some one sneers at you and says you are only a dentist, tell them that Horace Wells was a dentist and gave nitrous oxide to the world, the greatest blessing humanity ever received at the hand of man.

Dr. S. E. Davenport—The members of the Institute always, I think, feel their obligation to essayists who come from a distance, especially when they are busy men like Dr. Ebersole, and it would give us pleasure on all such occasions to show our appreciation. It is not often we have marked out a method by which we can do that, but tonight, it seems to me, we have.

In Pittsburgh, before the Odontological Society of Western Pennsylvania, on November 12th, 1907, Dr. Ebersole read a paper entitled, "Humanitarian Dentistry, What It Means, How to Practise It." In that paper Dr. Ebersole made the following statement, headed, "A Common Mistake":

"Many members of dental societies feel when a guest presents a paper that they should not severely criticise the same. This is a grand mistake, and I shall consider my efforts here far from satisfactory, if some good brother does not haul me over the coals. Therefore let each man state his doubts and disbeliefs, for they will be thankfully received, and from the expression of the same, we may all learn much of importance to us."

Mr. President, I see I am forgiven in advance!

The principal thought running through Dr. Ebersole's paper of this evening, viz: Such improvement in methods as will reduce the pain of dental operations, is of great importance, and regarding it too little has been said at dental society meetings.

Naturally enough the progress of dentistry, rapid as it has been, concerned itself most, at first, with the perfection of results, the consequence being that the splendid operators of thirty to fifty years ago were, with few exceptions, harsh in their methods.

Working as they did for years without the rubber dam or dental engine, good results could only be secured by the use of

great force in excavating, extremely uncomfortable ways of packing the mouth against saliva and a general heavy handling of the lips and other soft parts.

These harsh methods, together with the more frequent resort to extraction in those days, gave dentistry a reputation for pain, from which it is but slowly recovering.

With the many improvements of the present day it is possible for dentists to accomplish good results by delicate and humane methods and while there are still many skilful men who give too little attention to the great question of proper patient handling, the majority of busy operators are very considerate of their patients' comfort, thereby increasing their usefulness and popularity.

While I think that Dr. Ebersole is deserving of great credit for calling attention, not only in this paper, but in many of his previous writings, to the need for more humane methods and more careful handling of the patient, I think our essayist pictures the condition of the mind of the average patient in too vivid colors and I also feel that many of his suggestions for preventing pain are too radical and extreme both for the needs of the situation and for recommendation to young dentists as safe methods of practice.

I will use all my influence to aid Dr. Ebersole in impressing upon the members of our specialty the great importance of delicate manipulation and the use, when possible, of painless methods.

I will urge the protection at all times of the patients' lips by napkins; more careful handling of all the soft parts; secure rest upon the teeth, if possible, for the hand controlling chisels, burs or pluggers, to avoid injury from slipping and the use of every logical and safe plan for the reduction of pain.

I would reduce friction to the minimum by the use of new burs and well kept, sharp chisels and excavators, I would work upon dry cavities, having learned that moist cavities are more painful to excavate; I would use warmed air, hot phenol and such other local and safe obtundents as my knowledge of the idiosyncrasies of each patient assure me would be of the greatest value. In fact, along conservative lines I would go as far as would Dr. Ebersole in my earnest effort to minimize pain, but I would not resort to general anaesthesia, to local anesthetics ap-

plied hypodermically, nor to the use of high-pressure syringe except for the most rare and painful conditions.

It is not, in my opinion, the duty of the dentist to eliminate pain per se—it is unnecessary pain which he should guard against and strive by every logical and safe means to prevent.

Pain is Nature's method of expressing a condition of abnormality and is therefore a diagnostic guide of the greatest value. It would be impossible for us, when treating deep cavities of decay, to learn the exact condition of those cavities and therefore to decide upon the necessary course to follow, if we had previously benumbed the tooth to deprive it of all power to respond to careful excavation or thermal changes. According to my reasoning, all the obligation is not upon the dentist, but a measure should be borne by the patient who, desiring skilful service should appreciate the fact that living tissue is to be worked upon, tissue which can be deprived of the normal expression of life, even temporarily, only at the risk of permanent injury.

If I did not know what a high professional position Dr. Ebersole occupies in Cleveland I should be inclined to judge from his description of the highly hysterical attitude of patients toward dentistry that he had practised in a city frequented by tourists who could avail themselves of his services only once or twice.

Either the conditions are very different in Cleveland than in New York City or Dr. Ebersole is more observing, more sympathetic or more sensitive, for I certainly have not the same opinion regarding the attitude of patients towards dentists and dentistry.

A dental practice is controlled and moulded by the personality and influence of the dentist presiding over it and as the disturbed attitude of patients is based almost entirely upon anticipation, it is a mental condition which passes away after one or more sittings, if the operator gains the confidence of his patients.

If his touch be gentle and his manner calm but confident, the patient soon learns and uses the power which comes from repose and feels badly only when really hurt.

A family dental practice in the average American city of today has for its most valuable asset the children who enter it when they are from three to five years of age.

Except in the rare cases where a child has been frightened by the exaggerated tales of a tactless nurse, these children meet their appointments with us as they do with their various instructors, with equanimity and patience, for as soon as we gain their confidence they bear the little pain necessary and look upon dental attention as, if an evil, a necessary one.

Oliver Wendell Holmes said that "the making of a gentleman must begin several generations before birth." My feeling is, the attitude of patients toward dentistry depends largely upon and reflects the guiding influence and controlling will of the dentist who serves them, which is particularly true when those patients have been in his hands since childhood. Knowing as we do the dependence placed by patients in our expressed judgment, as well as the power of suggestion, is it not our duty to refrain from magnifying the severity of any conditions by resorting to extreme and radical methods for overcoming pain? The oculist carefully guards against placing too strong glasses before the eyes of his patients, knowing that by so doing he would decrease the action of the muscles of accommodation—and may we not err lamentably by too great a readiness to apply a strong remedy than is indicated and, by such means, unfit our patient for further co-operation? Of course no dentist can control or succeed with every patient who comes into his hands, but as the actual pain of ordinary operations is slight, he has but to gain their confidence in his gentleness, his judgment and his skill, to overcome their apprehension, which is usually the basis of such fear of the dental chair as they may have. Henry Ward Beecher, when asked what he would do if he noticed that people were sleeping during his sermon, replied: "I would say, 'wake up, preacher!'"

The President—Our friend, Dr. George L. Parmele, of Hartford, has asked the privilege of discussing the paper, and I will request the Secretary to read his communication.

Dr. George L. Parmele—Regretting that I cannot listen to the paper of the evening, and having a sympathetic heart, I desire to go on record as a strenuous advocate of humane dental technique.

It can hardly be questioned that a large percentage of operators feel that heroic methods are in order. Either through thoughtlessness or from a mistaken idea that gentleness and thoroughness are incompatible, they inflict much needless pain, where a little forethought would avert most of the discomfort.

At an examination of candidates for dental license, an applicant with the hardest blows of an automatic mallet was packing gold into the tooth of his wincing victim. Being with the examiner, making his rounds, I was gratified to hear him exclaim, "Good Heavens, man! Do you not realize that it's a human being you are working for?" I trust the remark made a life-long impression upon the would-be practitioner. Of what avail to save the tooth and kill the patient? Of course we can say, in the words of the surgeon, "the operation was a success, but the patient died." In the chair of a brother practitioner I was forcibly reminded of a maxim overheard in an engine room, "Never put cold water on a hot flue." While the cold injection upon my tooth was not so disastrous as it would have been in a hot boiler, it made a lasting impression.

I will not take time to enter into the details of humane dental technique which, no doubt, has been ably presented by Dr. Ebersole, but will only reiterate the statement that a little carelessness often causes immense pain, while forethought, gentleness and attention to proper details will reduce discomfort to the minimum and win the heart-felt gratitude of patients.

Dr. Arthur H. Merritt—I have been greatly interested in listening to Dr. Ebersole's paper. I think the principle for which he contends is a worthy one, and cannot be too often presented. It is too often true, that in the exigencies of daily practice, we are negligent and careless, and I believe that there are a few of us who cannot learn from Dr. Ebersole the lesson of greater consideration for our patients.

I believe, however, that the picture which he presents is an exaggerated one—the dread of dental operations is nowhere near as great as he represents it to be; nor do I believe that such operations, when performed with care and skill, which characterizes modern dentistry, are, with few exceptions, so painful as to justify the employment of anaesthetics.

There is no analogy between the practice of dentistry and that of medicine. Dentistry is essentially surgical. The prac-

tice of medicine depends for its success upon the therapeutic action of drugs. Nor is the analogy between general surgery and dentistry so close that they can be contrasted to the disadvantage of the latter.

The general surgeon deals almost exclusively with soft tissues, where either a general or local anaesthetic can be used to advantage. Not so with the dentist, who is called upon to operate daily upon the hardest tissues of the human body, where the use of a general or local anaesthetic is impracticable, except in rare instances. To say that dentistry "has not entered into her own" because she has not made the same use of her great discoveries as has surgery, is in no sense a criticism. Dentistry gave anaesthesia to the world, and has, I believe, made all the use of it to which the nature of its work permits.

That there are careless and indifferent operators in dentistry, there is none to deny, but that such operators are all within its folds, I seriously question.

Dr. H. W. Gillett—The principle for which Dr. Ebersole contends is an exceedingly valuable one and needs to be constantly impressed upon us all. I never lose an opportunity with students to urge upon them the thought that if they will study to relieve their patients of the little, annoying, nagging discomforts, they will find them much more capable of bearing the unavoidable discomforts and pain.

I want to make a suggestion concerning the points of view taken by Dr. Davenport and Dr. Merritt. I know less about Dr. Merritt's practice, but it is my idea that Dr. Davenport's practice is the extreme type of family practice—that a large portion of his patients are those who have grown up in his hands.

This means a very different viewpoint from that of the essayist or from that which I occupy. I agree entirely with what Dr. Davenport has said concerning the attitude of the patient towards the dental practitioner in such a practice as I believe he is called upon to manage.

I agree entirely with what the essayist has said concerning a type of practice which many very competent practitioners are called upon to handle, and I also agree with the attitude Dr. Ebersole has taken concerning the dread with which a large proportion of the intelligent clientele that comes to us regard our ministrations. I have stated many times to my patients that

if I could control for the new patients that inherited dread—that dread that has been planted in their minds by parents, and by ill-advised attendants—maids, governesses, companions—if I could control that feature of dental suffering, I could take care of all the rest without any difficulty.

My troubles are among that class of patients who are in one city for a few years, and then go to another city, where they fall into the hands of a different practitioner. They do that perhaps three or four times in their lives. They get into the hands of the kind of people that I think Dr. Ebersole and Dr. Parmele mentioned as having seen in the State Board of Examination—men who never think of the patient as a living, breathing human being. They regard the patient as a block of ivory, in which they are going to put a filling, and that is all that concerns them, except to get the price for it.

Personally, I do not feel that I would go quite as far as Dr. Ebersole advises; and yet, as I think it over, I remember cases in which I have been obliged to do just that. I have received, within three days, what seemed to me a check for an exorbitant bill that I sent last summer—for one day's services—and as an illustration of what I have just said, and without taking up any other of the many little details that occur to me, I will speak of that case. I had an anaesthetist give that patient ether, and she was kept under ether as long as the anaesthetist thought judicious. I removed two or three pulps and prepared and filled several cavities, some of them temporarily and all with plastics. I followed that course because the patient had such an exaggerated dread of the dental operator that the moment an instrument is picked up from the table, she is entirely unable to control herself. She came from the hands of an able, careful, gentle practitioner. She came to me by advice of a patient of the same type for whom cataphoresis had solved the problem—one who insisted upon being chloroformed before she would allow an instrument to touch her teeth. By yielding to her wishes at first and gradually instilling into her mind confidence, I have her now in a condition where she submits cheerfully to ordinary operations.

For the patient who was etherized two hours were necessary at her first appointment to gain her confidence to such a degree as to permit an explorer to be used. A second appointment for the next day resulted in a very little work. Consultations between

myself and her dentist, and herself and her physician, resulted in her coming with a trained nurse, and I employed an anaesthetist, and devoted the whole day to her. The payment of the exorbitant bill was accompanied with a most appreciative letter.

I can quite understand the point of view that that is a ridiculous thing for a dentist to do; but I believe that by doing it I have secured that patient's confidence, that I shall remodel that patient's attitude toward dentistry; and that by starting in that way I am going to be able to transform her mouth from a condition that any intelligent person must necessarily be ashamed to have even the dentist who knows its condition look into a second time—to one of health and usefulness. I believe such a result is worth the effort.

Dr. J. O. McCall—I have enjoyed the paper very much, and I have enjoyed Dr. Davenport's discussion still more. There is one point which has not been brought out, which I should like to mention—not in criticism, I hope, and yet with the idea of perhaps showing up a tendency to a weakness that I see in a great many papers written by members of the dental profession.

Dr. Ebersole states that, properly used, there will be no bad effects from the high pressure syringe—but he does not give us any proof as to that. The paper is such an excellent one, that a statement of that kind is apt to be accepted without asking proof—and I believe that such a statement should have something said in support of it. We know that the use of the hypodermic syringe in soft tissues is often productive of harm. In the ultimate analysis, I cannot see any difference between the use of the hypodermic syringe in the soft tissue, and the high pressure syringe in the teeth, for the reason that the effect of the cocaine solution is on the soft tissue, which is contained in the tubuli or cemental substance of the enamel.

We are forcing a substance into the tubuli, and that must displace a certain amount of the moisture therefrom and produce a certain amount of disturbance in the pulp at the point to which the tubuli penetrates. While there may not be any harm done, I do not like to hear a statement of that kind made, without some idea being given as to why no harm should be done, especially as we know the dental pulp is a very delicate tissue, very susceptible to injury, and a tissue which has very little recuperative power. I feel we have not heard the last of the use of the high pressure

syringe when we see that a tooth which has been filled remains in good condition two or three years after the time of the operation. Degeneration may be so slow that we may not see it for some time. We should be slow in using an agent which will enter the tooth substance. Personally I feel much more like using partial anaesthesia with nitrous oxide, which I do in my own practice, in extreme cases, with much satisfaction. Any liquid which must be forced into the pulp I must depreciate the use of, although I am not in a position to say it does harm. It is the principle that I wish to bring out, rather than any specific criticism.

Dr. H. L. Wheeler—I was greatly interested in the attitude of the essayist and I believe that his point of view is correct. Very likely many cases of pyorrhea and loosening of the teeth are due to the harshness of our operations, and to the fact that we have not taken the time or used the method that would produce the results without too great a strain upon the tissues in which the teeth are set.

But I could not help thinking, as I listened to the essayist, that his practice must be surrounded by sanitariums. What a lot of neurasthenics! I do not see in two years half a dozen such people, and I have but once in nineteen years of practice had to resort to a general anaesthetic for the purpose of making a filling. Practices vary, as Dr. Gillett pointed out, and a man with a family practice, like Dr. Davenport's and Dr. Howe's, may not see the same conditions that the men with a changing practice does. Still, I am quite sure if a patient returns two or three times, a dentist can get a reasonable control over that patient, and if I could not, I should advise the patient to go to someone else, very frankly.

There are no practices that might not use some of the methods advocated by the essayist, in extreme cases. The high pressure syringe, general anaesthesia or even cataphoresis are seldom necessary for the comfort of the patient. I am not advocating the treating of patients as though they were blocks of wood. I am advocating the humanitarian method—gaining their confidence, and making the patient wish to come again. That can usually be done without the use of extreme measures.

The President—May I give a brief word of testimony from something that happened in a family practice, in the case of a

mother and daughter? A patient of mine at seventeen years of age, had an attack of spinal meningitis, from which she barely recovered. After that her nervous condition was such that the slightest pain would send her into a slight convulsion. She would straighten up and almost slide off the chair. She had already confidence in me. At first I used cataphoresis, but by being very gentle with her she was after a while willing to dispense with the cataphoresis, and we succeeded by putting in gutta percha fillings. I think this may be done in such a gentle and tender way that the patients feel we are in sympathy with them, and that we feel the pain almost as much as they do themselves. She afterwards married, and her little daughter came into my hands—first with her temporary teeth very badly decayed, and later with large cavities in the crowns of all her first molars. That child had within a year had adenoids removed, had operations on her eyes for strabismus, had operations on her ears—and to have anyone come near her face would drive her almost into hysterics.

Poor little puss! I had to coax her with playing and all sorts of things to get her to let me even come near her and look at her mouth. I was finally able to put a little nitrate of silver into her teeth, showing her nurse how to use it, to keep them from sensitiveness and check decay.

The next year her father sat in the chair and held her in his lap, and we pretended to fill her teeth. But just that little trick of having him sit in the chair and hold her, we got a little gutta percha in one of her teeth, and from that time on, we have been able to overcome that great fear, by gentle means, doing whatever was necessary.

The child had been in a hyper-sensitive condition, but with gentleness and tenderness it was wholly overcome. My sympathies are strongly with the essayist. We have received a forcible impulse towards right treatment of our patients by hearing this paper.

Dr. Gillett—You gentlemen who have not used cataphoresis, and have not used the extreme methods spoken of may not have had the experience of getting control of patients of the sort who demand such measures, and having them send other patients to you who are many times worse than they are.

Dr. Ebersole—I am very thankful for the many kind expressions, and am gratified in being able to stir up a little discussion.

I thank Dr. Davenport for his allusion to the little statement I made in Pittsburgh about a year ago.

The picture in my paper is one that was painted upon my memory something over twentytwo years ago. I stated that it was an old picture; but, gentlemen, I will paint you one somewhat similar, which occurred less than three years ago in Columbus, before the Ohio State meeting. The operation was being performed by a man from the Northwest, who is one of the strongest advocates of the Black "extension for prevention" theory—one who belongs to the Black club—one whose name is familiar to every man in this room. He came to Columbia to deliver a lecture and give a clinic on cavity preparation and the insertion of gold fillings. The patient secured was a senior dental student. He was placed in the chair and the scene which led to the production of the picture painted twenty-two years ago was produced in that chair before the whole society, and this, too, by what we would term a modern dentist.

Following that, the essayist upon that occasion, told a story in the discussion of his paper, in which he recited his own personal experience at the hands of the king of kings, as far as extension is concerned, in Chicago. He said he had been having considerable trouble with a tooth and went to have the tooth taken care of. The king bee placed him in the chair (the patient was this great Northwestern man) and commenced his operation. The patient turned and twisted, sweat and swore. He stood the operation as long as he could, and finally put up his hands, tore off the rubber, and drove the old gentleman into the corner, threatening to kill him if he touched him again. And from that time on the patient said he had never had a tooth touched.

Taking up the question raised by Dr. Gillett and Dr. Kimball with regard to the handling of very nervous patients, and as an excuse for the paper I wrote, I may speak of a little experience. As an advocate of humane methods in dental practice, and being a stranger in a strange land, knowing no one in the city in which I started except men in the same profession, I thought if I took time and care to prevent pain in the performance of dental operations I would receive those nervous patients who were not re-

ceiving attention from men performing good operations, but failing to consider the feelings of the patient. My practice was built from just such patients as described by Dr. Gillett and your President tonight.

The patient Dr. Gillett operated on with the general anaesthetic, will in time be a good patient, and will require but little in the way of obtundents. I have seen that change time and time again.

In my early experience I labored with those people until I was a physical wreck, but today I am not required often to go to those extreme measures, because I have now an established practice, with many patients who have developed just as these men have described tonight.

The case referred to, in which the Lucadescent lamp was used, is one similar to those described by these gentlemen.

To answer the question of Dr. McCall, I can readily understand why it seems impossible to use anything as powerful as the high pressure syringe and not injure the pulp. I will not take the time to explain exactly the similarity between the influence of the use of the hypodermic needle upon the soft tissues in the mouth and upon those in the pulp; the method should be used in a rational manner, not putting on all the pressure possible or leaving the remedy there an indefinite time. I have often made the statement, and I repeat it now, that in using high pressure anaesthesia, the moment the most remote portion of the cavity can be excavated painlessly, high pressure should cease, if the best results are to be obtained. Then there is absolutely no excuse for injuring the pulp.

I do not believe in making an extra cavity that cannot be included in the original cavity with high pressure anaesthesia, nor am I afraid when conditions demand it to make my initial pit in the bottom of the cavity, and I am not afraid of forcing anything into that pulp that will do damage.

I have in my hand the instrument I use—an instrument with which all here may not be thoroughly familiar. It is known as the Myers instrument—a very much improved instrument because it has an attachment for maintaining the pressure, not requiring the nervous strain on the hand in holding the pressure. In making the pit we use a No. 1-2 bur—I spoke of its not being necessary to penetrate the enamel. Sometimes the cavity to be filled happens

to be on the distal surface of a second or third molar so far below the gum margin that it will be very difficult to apply cataphoresis. In a case of that kind I believe we are justified in making the initial pit in the solid tooth substance, say on the mesio-buccal lobe. The moment the patient feels the slightest sensation high pressure anaesthesia may be started with the assurance that success will come whether the enamel has been penetrated or not. As an illustration of how this may be done; ligate two pieces of heavy rubber, dam very tightly around the neck of the tooth, and around the needle of a large syringe, making a sort of a balloon, which should be filled and allowed to remain for a length of time. The pressure of the rubber will gradually force the solution into the enamel. I was criticised severely for the statement I made at Pittsburgh. I was told the tooth received its moisture from the pulp, but if the rubber is extended over a portion of the tooth, the portion exposed to the air bleaches very much, and the other portion remains in its normal condition. In answer as to whether the pulp supplies the moisture, or not, I said that if we took a pulpless tooth and put the rubber over it, we would find bleaching there also. Therefore, moisture must penetrate the enamel.

In obtunding the cavity I speak of, starting from the mesial side of the tooth, to reach a cavity in the distal approximal surface, it will not be necessary to anaesthetize the entire pulp, simply the dental fibre that lead off from it. That can be done without thoroughly anaesthetizing the pulp. That is a broad statement, but I have tried it time and time again, and found I could cut into cavities of that kind without sensation.

There is only one theory to present, and that is, that a liquid forced into the pulp chamber surrounds the pulp and affects the fibrils before it affects the pulp itself. That cannot be done without influencing the pulp, but it need not be thoroughly.

I do not believe there is any one thing that people will pay for more readily than for having pain eliminated from dental practice. I do not think, and I will say so again, that there is a man within hearing of my voice to whom the radical statements of this paper need apply. It is not the men who attend dental meetings the country over, who need the stimulating effect that a paper of this kind must produce. It is for men who do not keep abreast of the times, and I am willing to confess that you

New York men have gotten beyond the stage that we in the West have.

Dr. Gillette—Will Dr. Ebersole kindly tell us where information concerning this lamp he speaks of is obtainable?

Dr. Ebersole—It is made in Chicago by the Spear-Marshall Co. It is known as the Lucadescent lamp. I obtained mine from the Cogswell Dental Supply Company in Cleveland. Dr Retchy in Minneapolis wrote the first paper concerning it, and brought it to my attention.. It is advertised in most of the medical journals.

Dr. McNaughton—How does Dr. Ebersole get that initial cavity in the bottom of the cavity without pain?

Dr. Ebersole—If it is a cavity that can be entered cocaine solution can be applied, using the unvulcanized rubber.

Dr. McNaughton—Would that not answer for the rest of the excavation if it answers for the little pit?

Dr. Ebersole—Sometimes, but not always.

Dr. McNaughton—Would water answer for it?

Dr. Ebersole—No, sir; it would not. That is a fallacy. Now as to the question of the mental condition being overdrawn. Dr. Davenport said we were liable to do harm by letting the patient believe that such and such things were necessary. We do not go at it that way. We let the patient know that we have, and will use things to enable us to render the operation painless, and in that way, knowing that we have something and can and do use something, if necessary, we have gone a long way towards securing the confidence of that patient.

A rising vote of thanks was tendered to the essayist for his excellent paper.

Adjournment.

PROGRAM OF THE AMERICAN MEDICAL ASSOCIATION,
SECTION ON STOMATOLOGY—MEETING
AT ATLANTIC CITY, JUNE 8-11, 1909.

1. Chairman's Address—Edward C. Briggs, Boston, Mass.
2. Enamel and its Vitality—R. R. Andrews, Cambridge, Mass.
3. A Study of Mal-nutrition in the School Child—E. Mather Sill, New York City.

4. Suppression of the People's Disease—S. B. Luckie, Chester, Penn.
5. The Role of the Teeth in Respiration—F. L. Stanton, New York City.
6. Oral Prophylaxis—Alphonse Irwin, Camden, New Jersey.
7. The Tonsils and the Teeth—G. Hudson-Makuen, Philadelphia, Penn.
8. Mouth Conditions in their Relation to Systemic Infection—Frederick K. Moorehead, Chicago.
9. The Surgery of Cleft Palate—George V. I. Brown, Milwaukee, Wis.
10. General Therapeutics and Surgery in Dentistry—Arthur R. Dray, Philadelphia, Penn.
11. Conservative Surgery for Treatment of Tumors of the Mandible—Thomas L. Gilmer, Chicago.
12. A Method of Treating Mandibular Fracture—Robert T. Oliver, West Point, N. Y.
13. The Treatment of Extreme Degrees of Malocclusion of the Teeth by Operations upon the Ramus of the Inferior Maxillary Bone—Wayne B. Babcock, Philadelphia, Penn.
14. Osteomyelitis of the Jaw—H. H. Germain, Boston, Mass.
14. Report of two record Tertiary Cases—G. Lenox Curtis, New York City.
16. Tri-Facial Neuralgia—Fred Hussey, Providence, R. I.
17. Anæsthesia—L. G. Noel, Nashville, Tenn.
18. A Summary of Thirteen Thousand Nitrous Oxid and Oxygen Anæsthetics—Charles K. Teter, Cleveland, Ohio.
19. Pseudo-pulpitis due to Rheumatoid Arthritis—William Mills, Baltimore, Maryland.
20. Dental Roentogenology—G. E. Pfahler, Philadelphia, Penn.
21. Report of the Committee of Revision of Pharmacopeia—Hermann Prinz, Chairman, St. Louis, Mo.; G. B. Squires, Somerville, Mass.
22. Report of the Committee on Vital Statistics—George V. I. Brown, Chairman, Milwaukee; Vida A. Latham, Chicago; Frederick K. Moorehead, Chicago.
23. A Number of Cases in which the Nasal Sinuses have been Enlarged by Orthodontia—E. A. Bogue, New York.

EDWARD C. BRIGGS, Chairman.

EUGENE S. TALBOT, Secretary.

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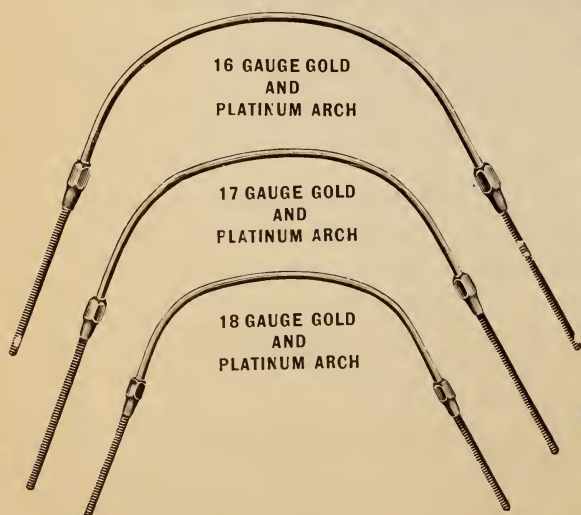
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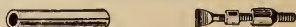
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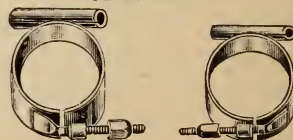
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OF

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VOL. IV.

JUNE, 1909.

No. 2

PROFESSIONAL DEVELOPMENT.

Whenever ethics have been alluded to they have been generally ethics as between practitioners. Of late there has been manifested in the dental world a consciousness that patients, yea, humanity has a right to the best that is in us, to the application of the principles of the Golden Rule. We ourselves, are ourselves, only because of the thousands who have preceded us, and contributed to make us what we are at our present arrived standpoint.

Not an invention is wholly our own; not an idea is entirely original; hence as we have freely received, it should be ours to freely give. We owe a debt to the past, and to the future, that the world should be the better for our having lived in it.

This idea has come to a good many in our ranks and the result has been the establishment of a few dispensaries where the poor may receive dental treatment and advice. An examination is now being made of the teeth of school children for it has been recognized that if the child cannot masticate it cannot be in good health, and if it is not in good health, it cannot efficiently profit by school instruction.

It has been proven that about forty per cent. of the absences of children from school are due to toothache, or abscesses, or some other preventable dental ailment, and that the money loss

to the tax-payers consequent upon these absences from school would pay for the early repair of such ailing teeth and preserve them. Dental services are needed in the schools, and the sooner the dental surgeon recognizes that fact and becomes willing to devote a portion of his time to the welfare of others who cannot compensate him, the sooner will he be recognized as belonging to the beneficent healing art.

Until he is willing to commence his professional life by contributing time and services to the poor he will never be able to command from the general public the consideration accorded to other physicians. We are not going backward but forward.

Two practitioners of our art in Germany have responded to the call so whole heartedly that they have given up private practice, and accept a very moderate salary, that they may serve only the children in the public schools.

They have so awakened the public conscience, which also they have enlightened, that the government pays their little salaries.

Our own army dental surgeons are doing the same sort of work, self-denying, largely unrequited.

There have been established dental teachings in various universities where the standard of teaching will not be allowed to go down, and right here in our midst one gentleman, well known for his self-denying labors in behalf of his profession, has devoted his private fortune to the eventual endowment of a dental school to be attached to one or other of the universities in New York, so that the teachings of that school also will not deteriorate.

The Virginia State Dental Association has been so impressed with the importance of dentistry that it intends to ask the legislature to pass a bill abolishing the dental law and requiring the appointment of two dentists on the Medical Board to examine dental specialists who have received full medical education. They propose to institute a course in their schools just following the close of the medical course for the instruction in the theory and

practice of dentistry of those who desire to practice that specialty. This course is for two months of each year of the four years of the medical course so that when the student finishes his general medical course he will have finished his dental branch. The Virginia State Dental Association has thus taken a practical step to accomplish this union of dentistry with medicine in the State of Virginia.

The Royal Society of Medicine of Great Britain has already received the Odontological Society into full membership, thus acknowledging dentistry as a branch of medicine in Great Britain.

In France a new dental law was promulgated on the 11th of January, 1909.

It marks the recognition of dentistry as a special calling, and is a stage in its development.

Careful instructions are given about private pupilage with licensed practitioners, and in regard to the three years of subsequent instruction.

Directions are given for the examination of these students at each stage, before advancing to a subsequent stage. The government, composed of practical men of affairs, has recognized the need of, and provided for the trained and skilful man to care for the teeth before the medical teachers have recognized this need.

It does not require a very far-sighted individual, however, to see that all branches of the healing art must eventually become united.

It seems invidious for an editorial in the *Revue de Stomatologie* of France to call attention to the pleasure which it gives to the dentists, in view of this new law, to see themselves treated apart and alongside of medicine. Then to add,—“folks sometimes have a better time in the pantry than they would have in the dining-room.”

Also in the *Dental Cosmos* for July, 1907, appeared a most admirable editorial succinctly reciting the development of surgery from the barber shop to the proud position which it now occupies as the leader in medical science.

This was preliminary to the treatment of dentistry along these same lines of development.

The editor justly says—"As science and scientific methods are replacing ignorance and empiricism, in just the same ratio is greater tolerance and respect being developed among all workers for the human weal, workers in the healing art included."

Following this admirable epitome of our true position, comes this most inappropriate ending—"the dentist who does attend the Buda Pesth Congress, (of Medicine) by that act will dissociate himself from affiliation with the dental profession, and the dental profession should so regard it."

One might ask who is this that presumes to dictate to the dental profession what its duty is?

Dentists and stomatologists have been for years supplementing such teachings as were available, either public or private, with investigations and writings along the lines of their specialty. They, of course, were the only investigators and inventors along these lines, for the general practitioner of medicine has thus far mostly confined his investigations to the questions,—where is the pain? and his inventions to some means of relieving it.

It has been left to the specialists themselves to make such progress as they could toward freeing their fellow men from oral diseases. One of the steps in the progress of this evolution was the effort to establish a journal in which the ethical spirit might prevail from the very start, and the invitation to join the self-denying workers, who are striving to pay the debt they owe humanity, is much like the invitation given to soldiers asked to volunteer for a hazardous undertaking. Peril, obloquy, unrequited toil, and unintermitting effort awaits those who enter the ranks, and the law of atrophy is ever active; "To him that hath shall be given" for the exercise of his gifts increases them; and "from him that hath not shall be taken away even that which he seemeth to have;" for is failure to exercise those gifts results in their disappearance. The law of evolution is established, and it

is along these lines that our specialty must work. There can be no sudden reform. We only live that we may overcome; let us rejoice in the difficulties that we confront. To those who endure in the fight will come the consciousness of having helped to make the world better, and the inscription that was placed over General Gordon's tomb may encourage some of them.

"He gave his strength to the weak,
His substance to the poor,
His sympathy to the suffering,
And his heart to God."

E. A. BOGUE.

THE IDEAL AND THE REAL IN DENTISTRY.*

BY GURDON R. MAC KAY, D. D. S., BOSTON.

Students covering the domain of religion and philosophy are undoubtedly agreed in their opinion that there must be a standard or ideal condition to aim for in order to bring about the best condition in life. When we apply this theory to the professions, and various occupations of man which go to make up the more practical side of life, we are impressed more strongly than ever with the importance of following in that direction which will lead nearest ideal results. The advisability of exercising every effort to bring the real or accomplished work as near the ideal as possible, is apparent.

We are obliged to admit that the theoretical ideal keeps a little ahead and beyond us, but there is that practicable ideal based upon the most thorough practical and scientific knowledge available of the subject, and the conditions surrounding the same, which is obtainable providing a sufficient amount of skill and energy is used in its accomplishment.

As this is an advancing age, and our knowledge is increasing in all directions, so that what appears to us as theory today may be accomplished in practice tomorrow, we will be permitted to reach a higher plane of practical results as time passes.

*Read before the American Academy of Dental Science, October 7, 1908.

While it would not be human for perfect results to be always obtained in any walk of life, there is ever present the opportunity to try for the most perfect results. Herein lies one of the weaknesses of human nature—the absence of sufficient resistance to withstand the inclination to choose the easier and not always the wiser course, which often leads in the wrong direction. For it is undoubtedly true that when we abandon the effort toward the highest ideal, we will more than likely follow the tide of least resistance and drift in the opposite direction.

In the profession of dentistry we are dependent almost wholly upon practical operations in the mouth for success in the treatment of dental disease. We have many scientific theories at work having for their object preventive dentistry, with the hope of tangible results in the future, but as yet there is a small amount of information developed which we can term conclusive. Aside from the conscientious practice of prophylaxis by endeavoring to keep the teeth and mouth thoroughly clean, there is little knowledge in our possession of a truly preventive nature. We are familiar with the cause and process of dental decay as it takes place in and around the teeth, as it has been presented to us by those tireless workers, Drs. Miller, Williams, Black and others; but we are in the dark as yet as to that systemic condition which allows the organisms of decay to operate. Until science has revealed to us the true predisposing cause of caries, and will point out that something in the individual which makes the destruction of the teeth in this manner possible, providing at the same time a remedy whereby this condition can be corrected, we are obliged to depend principally upon skilfully performed operations of a surgical and reparative nature for the preservation of teeth.

Even should nature be so gracious as to endow us with this knowledge, there would still remain, perhaps, the necessity for medical attention, or the regulation of our habits or mode of living in order to become immune. Rules and regulations are not usually observed by the majority of people, and there would still exist the demand for the skilful operator who has stood the test for so long a time. Science and practice seem destined to go hand in hand.

The dental practitioner of today must be broadly scientific, and at the same time intensely practical, in order to render the best service to his patients.

It is the delicate precision and thoroughness in detail with which this surgical and reparative work is performed, together with a keen knowledge and judgment of what should be done, how it should be done, and why it should be done, that we are dependent upon almost entirely for success in the practice of dentistry, according to present day standards.

The problem presented to the practitioner is not always an agreeable one. He is called upon to perform operations that from their very nature are disagreeable to the patient. He is dealing with highly sensitive structure, and, while no conscientious operator would hesitate to use every means at his disposal to inflict as little pain and discomfort as possible, we are unable as yet to remove all disagreeable features.

Patients place themselves in the hands of the dental practitioner with the confident expectation and belief that the highest ideals of the profession shall be utilized in restoring their mouths to a normal condition. The burden of responsibility rests with the practitioner, and he should be ever alert to resist any influence which would have the tendency to lead away from the desired results rather than toward them. Unless the operator possesses the disposition, or cultivates it, to get as near perfect results as possible, he will find many influences at work to induce him to fall short of his best endeavor.

It is impossible to conceive of any occupation which requires accuracy in its fullest sense more completely than the practice of dentistry. The absence of this one characteristic is probably accountable for many failures in dental operations and consequent suffering on the part of the patient. This inaccuracy or weakness of purpose produces the belief without the practitioner being aware of it, oftentimes, that a less laborious—or more simple—method will insure as good results as that which would take more energy or require a higher degree of skill.

There are also outward factors present of which we are obliged to be conscious because of the frequency with which we are called upon to deal with them. An important influence producing poor dentistry is the desire sometimes present to please and hold the patronage of many people who seek dental service with the strong conviction in their own mind that the time occupied should not exceed a certain limit, and the charge should

be made according to the popular idea on this point. All of which, if followed out by the operator, will perhaps give the patient a temporary gratification, but will bring about conditions in the near future which would be far from ideal. To be truly kind and considerate to any patient, each operation should be performed in the most perfect manner possible, and according to the best unbiased judgment of the operator.

Herein lies a wide field for missionary work on the part of the professional practitioner—to educate the public to the understanding of what good dentistry really means. That to reach the highest ideals in dental operations and to get results which will insure the health and comfort of the mouth for the longest possible time requires superior skill that must be directed by an intimate knowledge of the subject as it is known to the dental profession today. When patient and operator are in accord it is easier to obtain more perfect results. Intelligent people are quick to appreciate thoroughness and skill in any operation, especially when the test of time and comfort are applied to prove it.

We sometimes hear the assertion put forth that to do thus and so would require too much time, and certain methods must be taken in order to see all who apply for dental services. The chief concern to the mind of the dental operator should be quality rather than quantity. Individual capacity is limited, and inasmuch as he increases the quantity of his work at the expense of quality, just so far does he decrease the value of his services. The greatest good can be done the greatest number by correct proceedings at all stages. This does not always mean more time, for the operator accustomed to accurate methods finds it an easier task to do everything well. The element of habit is an important factor. By following this course we are giving the patient a more positive assurance against future discomfort, and at the same time we are deferring the necessity of doing the same work over for the longest possible time.

There is a very small percentage of every practice where we must lay aside our ideals, and deal with each individual case as we find it, regulating our dental operations largely according to the physical and mental condition of the patients as they present themselves to be operated upon. I refer to the nervous or physical invalid. This class must often have special consid-

eration, and the judgment of the operator must decide what course to pursue in each individual case. Temporary operations must be performed in many of these cases.

The class of patient who is deserving though poor should merit the consideration of the skilful dentist. For, as we know, in the larger cities especially, the successful man can have sufficient following of those who are amply able to remunerate him for his services, leaving no time for those who are not so favorably situated. Each individual should do his share of charitable work. The competent practitioner who takes a few of these cases and gives them the benefit of his skill at a price in keeping with their circumstances, or making no charge at all, is performing an ideal charity. He is strengthening his own character by the realization that he is making a sacrifice, and at the same time doing good to those who could not otherwise seek his services.

It would be impossible to practice dentistry approaching the ideal without careful attention being paid to equipment. In this regard, the same care and thoughtfulness should be exercised in relation to office, personal appearance, instruments and materials used, and in the general management of one's practice, as would be exerted in the actual technique of any dental operation.

First of all, then, there should be absolute cleanliness in everything—the clothing, personal appearance and surroundings should be clean. We should endeavor to have the best instruments and materials which possibly may cost a trifle more than an inferior grade, but the general aim should be for perfection in everything. The sterilizing of instruments to insure both patient and operator from infection is one of the all-important duties, the neglect of which (in this age) would be absolutely inexcusable.

All cannot be brilliant operators, but any dentist can improve his skill by exerting thought and effort in the right direction, and cultivating the disposition to be satisfied only with the best results rather than allowing himself to fall into indifference in this respect.

There yet remains, after the foregoing has been considered, what to me seems the most important element in the situation,—*natural qualification*—and the absence of the characteristics which go to make up this element is no doubt accountable for the failure

of many who take up the practice of dentistry as their life-work. It is not the purpose of this paper to discuss in detail this phase of the situation, but I believe some time in the future there will be established a technical or manual training school for prospective dental students—a preliminary term—whereby their training in the direction of mechanical dexterity can take place, and their aptitude noted. Also their general fitness should be observed, their sense of precision, thoroughness and reasoning power, and even the disposition should be studied. The weeding out process should take place here before entering the dental school proper to take up the broad study of dental science and practice. The characteristics referred to should be apparent at the preliminary examination of all prospective students, and should receive the same careful consideration as must be accorded the broader fundamental education. There should be a competent board established to pass upon this point.

It is a well known fact in this world that we are not all fitted for the same work. It is well that it is so, and also important for the community and the individual that each should have the good fortune to enter that calling or profession for which he or she is best fitted. There should be some preliminary examination that would be effective in ascertaining this fact.

This paper is not written from a pessimistic spirit. On the other hand, I am very optimistic as to the future possibilities of dentistry; but we have the weak features with us as there ever must be in all human endeavor, and it is only by focussing our attention occasionally on the weak points that we can hope to become strong.

THE DENTIST'S PART IN "THE CALL TO PUBLIC HEALTH."*

BY J. MORGAN HOWE, M. D. S., M. D.

The last annual address in Medicine at Yale University by Professor Wm. T. Sedgwick was entitled: "The Call to Public Health," and the liberty is taken of incorporating his apt phrase in the title of this paper. He reveals in his inspiring

*Read before the Boston Conference on Oral and Dental Hygiene, January 18, 1909.

address the earlier awakening of perception that this life is worth living, and the realization that Christ's words are to be taken earnestly when He said, "I am come that ye may have life, and that ye may have it more abundantly;" and he enumerates some of the different classes of scientific men whose services are needed, or are already availed of in answer to "the call to public health." Although dentists are not mentioned, the organization of the Dental Hygiene Council makes the impression that dentists propose to take part in making answer to the call. Let us consider what is our present status, and what existing needs will demand of us in our effort to make an appropriate reply. The general acceptance of the ideal of health for the people is one of the impressive facts of the present day. All departments of science that have a bearing on physical well being are contributing to its realization, and religion as taught and practiced, is concerned more today with abundance of life and health here, than with anticipations of future bliss. The laity seem at least equally with the professions interested in the subject, and the people are receiving with appreciation the services of Boards of Health and committees on Physical Welfare, and lectures on Medical Subjects, such as are given at the Harvard Medical School. Every dentist who has had opportunity to observe the condition of the teeth of the people has realized how great are the destructive processes that are depriving them of teeth, and of comfort and health in that particular. In front of a cheap restaurant in New York, there is a poster which reads, "Chew your food, your stomach has no teeth;" but most of us dentists know how unlikely it is that most of the patrons of such a place have the dental equipment to follow that excellent precept.

In Boston, and in New York also, the alarming prevalence of disease and loss of the children's teeth has received attention and organized efforts have been made to repair damages and to inculcate cleanliness for prevention. In England and in Germany also, the governments have been recognizing the need in this direction and acting on it. These endeavors to retard the tide of destruction are most commendable and necessary. You dentists of Massachusetts, who have organized the Dental Hygiene Council, are entitled to, and are cordially receiving, sincerest praise for taking the initiative in thus co-operating with the Medical Profession in the great response that it is now so

generally making to the "Call to Public Health." The fact that decayed, diseased and inefficient teeth are such important factors in the origin of many other diseases, and besides that are themselves the direct cause of much disability, is finding acceptance in the minds of physicians and of the public; efforts to improve the physical welfare of the people, young and old, would therefore be very deficient unless means are taken to improve dental conditions.

So as a result of the general awakening, we find in this country and abroad there is an extension of the effort to urge the need of cleanliness of the teeth, as the means of prevention of dental decay and disease. We say an *extension of the effort*, to get people to clean their teeth, because the effort has been made by dentists for many years among their patients, and this endeavor is now being enlarged to include the public. Not only have dentists been inculcating cleanliness among their patients, but they have been devising tooth brushes of patterns varying according to their ideas to assist in these efforts, and compounding powders and pastes and lotions to help in cleansing, and to produce an approach to asepsis. Then we also have the prophylactic treatment of polishing the teeth with pumice on a stick of wood, and the numerous germicidal lotions and pastes made by pharmaceutical manufacturers and advertised to produce wonderful reductions in the number of bacteria in the mouth. All these efforts have been worth while, for much has no doubt been accomplished in the way of prevention; but how much there is yet to be desired in this direction is apparent, if we consider that about 40,000 dentists are kept busy in this country, making repairs on the teeth in which decay has not been prevented,—only somewhat retarded,—or in making substitutes for those that have been lost; and that, too, among the select individuals who were able and willing to remunerate us for our services, who were predisposed to cleanliness by a degree of culture and means, and were desirous of following our advice, that they might save their teeth with a minimum of our attention. But the great mass of people have had no instruction in the necessity of oral cleanliness and no means to pursue any of these hygienic efforts, have had no repairs made, and have no resort but submission to the forceps when pain drives them to it. The efforts at prevention among our patients, while in some degree proportioned in effec-

tiveness to the diligence and persistence of individuals, has been determined mostly by their susceptibility to dental disease; a condition of predisposition, or an approach to immunity, definite knowledge of which we entirely lack. The reception given by dentists to the cast gold inlay, hailed with an eager welcome as an improved or more expeditious method of filling large cavities and restoring broken down teeth, seems significant of our degree of success in prevention; for the cast gold inlay is for the same select and limited class of patients for whom we have been prescribing cleanliness and antiseptics, all these years. That is to say, the welcome to the cast gold inlay is our acknowledgment that our efforts at prevention have been at the best, only partial; much in that direction remains to be desired.

When we come to prescribe these same preventive measures to the public at large, we know that helpful though they are, they will be certain to prove inadequate to appreciably stay the destructive process. Taking a part in this call to public health, creates for us an exigency in which we certainly cannot afford to abandon the only prophylactic measure we now have to depend on, but it presents more clearly our lack of knowledge of the causes producing the destructive process we seek to arrest. We must certainly urge cleanliness of the mouth and teeth with greater insistence than ever before; for being roused to the great need of saving the teeth of the people, we can but use our most effective means of prevention. This, with making repairs to the extent of our ability, will tide over the emergency in a measure. It will be doing the best possible with our present knowledge.

But the situation demands that a concerted effort should be made to increase our knowledge; that we begin to investigate the oral fluids that constitute the environment of the teeth, in which, we all agree I think, reside those characteristics that favor or restrain the processes of decay, and also of erosion. They sometimes even prevent decay altogether for we occasionally see persons whose teeth have not, and do not decay, and it is just as likely as not it will be a person who never used a tooth brush. It does not seem creditable to us, as a profession, that we do not know what difference there is between the oral fluids of a person whose teeth are very susceptible to decay, and whose greatest efforts at prevention are unavailing, and another

whose teeth are immune to decay, and who, perhaps, makes no attempt at oral cleanliness. The dentists' part in the present call to public health will include an earnest and persistent effort to ascertain what qualities of the oral secretions make for decay of teeth or for immunity, and what the general conditions of physical life that tend to cause the variations in those secretions. This should certainly be done in addition to the propaganda for oral hygiene as we now understand and advocate it.

We can consider the subject but little without the question naturally arising in our minds, why does the necessity exist among civilized people of pursuing so assiduously the various artificial means of oral cleanliness, antiseptic treatment, and laborious tooth polishing? Notwithstanding the evidence that dental disease has been prevalent among ancient, as well as modern people, we may reasonably suppose that at some time and among some peoples, decay of teeth must have been the exception, and not the rule, as it is now among us. Can we find out any facts that will begin to shed light on the way back to the condition of immunity, or some approach to it? Dr. Ottofy tells us in a paper (*) worthy of careful study, that there is a tribe of the Philippines that have now more perfect teeth than were supposed to exist; sixty-eight per cent. of the children whose teeth he was able to examine were found perfect, and those found decayed were affected only on the morsal surfaces of molars to a very limited extent. What he records about the diet, habits of mastication, and ignorance of the tooth brush and of anything we would call dental hygiene, is relevant to all considerations of etiology.

Advertisers would have us believe that each particular compound that they have devised has in it the promise and potency of prevention. But even if we should admit that for the sake of the argument, would it not be the equivalent of accepting some medicament as a hygienic measure, instead of seeking to restore natural functions? It is manifestly impracticable for the great majority to use any particular preparation, and what we have learned thus far by the efforts we have made towards cleanliness and disinfection is that the forces of destruction are at best retarded but little in susceptible cases. The oral secretions of the most of civilized people are so prejudicial to the health

(*) The Teeth of the Igorots. Dental Cosmos, July, 1908.

and integrity of their teeth, that the only condition of immunity that can be looked forward to is attained after they are no longer useful, in the grave, when the rest of the body decays. They are a tissue so enduring that they are able to resist outside disintegrating forces longer than any other part of the body, yet they are destroyed in situ by the influence of secretions generated by that body during life. What shall be done about it? Even a partial solving of the problem will be a service to more people than the elucidation of any other enigma in pathology. If it should appear that the preparation of food by civilized people has gradually developed a habit of bolting it before it was properly insalivated, and thereby has caused such a deviation from normal conditions in the digestive processes and secretions as to constitute an important factor in dental decay, it would merely confirm a natural inference from the facts stated in the paper of Dr. Ottofy, before referred to. He says the Igorots—who have such perfect teeth—prepare their food—largely vegetable—by cooking so little that it is necessarily masticated very thoroughly before it is swallowed. And then there are those other facts, of improved digestion, endurance, and efficiency resulting from the practice of Fletcherism. Intestinal fermentation, putrefaction and self-poisoning are now recognized as processes by which many pathological states are induced; and if it should be shown that the saliva and oral mucous are altered in such conditions so as to make them inimical to dental structures, it would be no more strange than the well-known sordes of the mouth resulting from typhoid fever. Whatever the characteristics and constituency of the oral fluids in health and immunity from dental lesions on the one hand, and in conditions of great susceptibility on the other, with their accompanying general physical states must be discovered before measures can be intelligently advocated for efficient prophylaxis. Dentists must take the initiative in this work, for with the advice and direction of physiologists and chemists they have by far the best opportunity to carry it on; both by facility of collecting saliva and by ability to diagnose dental conditions.

Some earnest inquiries have been conducted by dental investigators into the various qualities of saliva, but it can hardly be said that any important facts have been established; although some quite positive statements have been made about the varia-

tion of certain constituents of saliva being responsible for decay and immunity.

It has well been said that "in science the opinion of the highest authority has little weight, and should have none except as an incentive and guide to the research of others," and there seems to have been as yet in this matter of investigating the relation of the condition of saliva to decay of teeth, so little definiteness of statement in regard to methods of research that no effort could well be made by a similar technique to confirm or disprove the alleged facts. Whether for this reason or not, the investigations made seem to have been mostly, if not entirely, along independent lines, the stated results of which could with difficulty be compared. If all the work that has been done had been along similar lines, agreed on in advance, the accumulated data would have been immensely more valuable.

No doubt each student has considered his scheme the correct one and his method the best, whatever it may have been; but if a number of investigators were to work along common lines, by methods agreed upon as best, after mature consideration, and the advantages of consultation with those best qualified to advise in such research work, the accumulation of data would be rapid, the data themselves would be authentic, and conclusions might be expected to be reliable. The benefits of such co-operation would greatly increase the probabilities of success and bring nearer the time when knowledge of the subject could be claimed. The comment of a recent writer on the co-operation of artists in producing the prize winning picture "The Triumph of Truth Over Error," seems pertinent to our subject. He says, "Truth wins out in this world only when its worshippers put their heads together and organize. Even in its discovery co-operation is becoming ever more necessary."

Then too the great commercial achievements of "trusts" have been accomplished largely through the advantages of co-operation; economy of energy, or of cost, and prevention of waste. These are suggestions in favor of an organized research body, the members of which might be novices in scientific investigation, but who could be coached and reviewed in their work by competent advisers. No observers can ever have the advantages of dentists, as has been said before, in opportunities to collect saliva, and record existing conditions of teeth in each case. There

can hardly be a doubt that many dentists who have realized the need of investigation of the etiology of the destructive influences affecting dental tissues have been deterred from undertaking such work by its apparent greatness and intricacy, and to these considerations might be added the fear that the time so devoted would be wasted, because possibly the plan of research might be found later to be faulty. These obstacles to individual initiative are well calculated to give one pause, but if organization, co-operation and consultation of competent advisers were made preliminary steps, these objections would vanish.

With no disposition to minimize the difficulties of such an undertaking, but on the contrary fully realizing its complexity and magnitude, it still seems necessary that in assuming the responsibility of answering "The Call to Public Health," we must use every means, to not only give the benefit of all our present knowledge for the saving of the people's teeth, but we must seek to add to what we already know in order that our service may become more effectual than it is.

None know so well as dentists the importance and value of teeth as necessary parts of the apparatus for beginning the digestive process, and none can so readily see that some chronic aberration from physiological functioning must be responsible for the susceptible condition of civilized people to disease and loss of teeth. We can meet the newly realized importance of teeth preservation, only by seeking more light on the problem that confronts us, in responding to the demand of health for the people.

AN APPRECIATION OF THE LIFE OF THOMAS FILLEBROWN, M. D., D. M. D.*

BY H. A. KELLEY, D. M. D., PORTLAND, ME.

It seems to me that dentistry might be divided into two quite distinct periods,—one to include all that transpired before about the time 1840 and the other to include all since then. In this latter period we find modern dentistry developing and the

*Read before the American Academy of Dental Science, Boston, Mass., February 3, 1909.

great men that made the dentistry of today living. The past decade or so has seen pass off this stage of ours, that we call the world, many men but for whom dentistry would have been much less the noble profession we know.

Maine, my adopted state, has furnished more, we think, of the great Americans of modern times in the various walks of life than one would expect of a state so small in population. Therefore one would expect, as he read down the list of Maine men that have won distinction, that when he came to the profession of dentistry he would read there some names of eminent dentists. And so we find it; and alas it is also true the two names I select from them all, Dr. Thomas Fillebrown and Dr. Elbridge Bacon, must be starred for death has claimed them.

It is well we should pause once in a while and study the lives of these makers of dentistry that we may learn the lessons their lives may teach. And tonight I am going to ask you to listen while I sketch the life of him who, in my estimation, was the greatest dentist Maine has ever given to the world, indeed one of the greatest of his time—Dr. Thomas Fillebrown.

It is fitting this appreciation should be delivered before this Academy for at the time of his death he was your President.

Dr. Fillebrown was born in Winthrop, Maine, January 13, 1836, the son of James Bowdoin and Elmira (Butler) Fillebrown, died in Boston, Massachusetts, January 22, 1908, and was buried in Portland, Maine.

He is survived by a widow, two sons (one, Charles D., a physician of Boston) and two daughters. He was married to Helen O. Dalton September 2, 1861, at Kents Hill, Maine.

My acquaintance with Dr. Fillebrown began when I, a young man of twenty, entered the Dental Department of Harvard University. Dr. Fillebrown was then Professor of Operative Dentistry in that school, and owing to the age and infirmities of Dr. Chandler, the Dean, it was he that seemed to me the head of the school. You know he was no laggard and when there was work to do there you found him. Thus it was very natural that he should assume, and discharge, many of the duties of a man too old and infirm to attend fully to the duties that naturally belonged to him. Because of this condition I immediately became aware of one of Dr. Fillebrown's most notable characteristics, his ability and willingness to do things.

Of course such a nature makes mistakes—makes enemies, for some one has said the man who never makes mistakes is the man who never does anything.

After my term at college I was engaged by Dr. Fillebrown as an assistant and you may be very sure I felt proud indeed to be selected by the Professor of Operative Dentistry as his assistant. After one year of this arrangement I passed from his assistant to his associate, and we were associated together in all just ten years to a day. He and the man in whose office I first studied, Dr. E. V. McLeod, of New Bedford, Mass., it seems to me did more to shape my professional life than any other two men. I think Dr. Fillebrown believed, from a very early period in our association, that I would succeed to his practice in Portland. He loved that practice and labored with me even as a father with a son. All this will suggest to you how intimate was our relations and how with this love in my heart I approach my subject.

Dr. Fillebrown's nature was not one that easily begot love, as did that of Dr. Bacon, and yet this tendency to repulse affection was but external. As you knew him more and more you found yourself loving him. I think this nature was largely the result of his hard life, for things did not come easily for Dr. Fillebrown. This life of ours at its best is but a struggle for existence and this was particularly so for him. I so well remember the scene at Alumni Day at Harvard Dental School, when, after his long term of service at the school he had tendered his resignation. So many, many pleasant things had been said, gifts had been given and there was much applause from the students and the graduates. As Dr. Fillebrown began his speech in reply to all this he said: "You have me at a great disadvantage. I am not used to this sort of thing. It is a novel position you place me in all these compliments, these gifts, etc. It is fighting I am used to." And I who knew how true it all was felt so sad that it was true that this splendid man had had to fight and to fight. All I could say to him that day was: "I am so glad you could have lived to have had this day." It was such an unusual day for him.

Many of you knew Dr. Fillebrown quite well and those of you who did will, I think, agree with me that while Maine has

given some big men to our profession of them all none could measure up to the standard of Dr. Fillebrown.

Take his professional record, who of all the Maine dentists could equal it? Think of what it was to have been a Professor of Harvard University. Some one asked that great black man, Booker Washington, what was the greatest surprise of his life, and he told them the story of how Harvard offered him his Honorary Degree. How as he sat on his porch one Sunday morning the postman reached him a letter in which President Eliot asked him if he could be present at Cambridge the next June, and informed him it was the intention of Harvard University to confer upon him an Honorary Degree. And Washington says in his book "Up From Slavery," as he thought of the poor colored boy working in the coal mine and of all his struggle in life, and that he had lived to be asked by the oldest and greatest university of this land to accept from it an Honorary Degree,—as he thought of all this (and of the space from the child to the man) *this* was the greatest surprise of his life. But this was not an Honorary Degree that was offered to Dr. Fillebrown, but a call to work. But it was little, if any, less an honor to be asked to labor in so responsible a position in this great university. When the re-organization of the National Dental Association took place in 1897, Dr. Fillebrown was selected as the first President of the re-organized association.

At the World's Columbian Dental Congress there were five papers selected, from all those presented to the different sections, to be read in open congress. Only one of these five papers was written by an American citizen and that one was written by Dr. Fillebrown.

When the fiftieth anniversary of the discovery of anæsthesia by Dr. Horace Wells was celebrated in Philadelphia, two men were chosen from out all the country to give orations at the banquet. One was our Dr. Fillebrown and the other Dr. Garretson.

If we turn from this literary side to the manual side perhaps the thing that Dr. Fillebrown would most like to be remembered for is his work in the field of Oral Surgery. One of our learned men, a former patient of Dr. Fillebrown's, in talking to me of him asked me if I had ever noticed no matter how great a man became in any one calling he always thought

he could have succeeded more in something else. "Now," he said, "Dr. Fillebrown told me once he wished he had been a full fledged surgeon and I asked him why. And he replied "Dentistry does not cut near enough to the life line." Those of you who knew him well enough can appreciate this. I simply tell it to show his love for surgery. His operations for Cleft Palate and Hare Lip were very skilful and the uniform surgical success that he obtained in these trying cases was rare indeed.* His operation for Hare Lip was novel, and the results much more satisfactory than by the older methods. His resection of the Inferior Dental Nerve, operating entirely within the mouth, was a great advance over the operation beginning with an external incision. These operations in and about the mouth led him to deplore the use of interrupted anesthesia. To deplore was to invent with Dr. Fillebrown, and so we find him devising the apparatus "for continual anesthesia while operating on or in the mouth," which he so successfully used in all his later operations.

His connection with the Dental School of Harvard and his work there I consider among his greatest achievements and I cannot pass over this period of his life without presenting to you this letter written by President Eliot, of Harvard, which shows something of how long and how earnestly he worked for that school and how much it was appreciated by that great college president so soon to lay down the cares of his presidency. I trust this appreciation is shared by all sons of Harvard interested in the Dental School.

President Eliot says: "I had great regard for Dr. Fillebrown, and am glad to bear this testimony to the value of his services.

"Dr. Thomas Fillebrown was connected with the Harvard Dental School for twenty-one years, first as Professor of Operative Dentistry (1883-1897) and then as Professor of Operative Dentistry and Oral Surgery (1897-1904). He succeeded Dr. Luther D. Shepard, who had been an active teacher in that Department for fifteen years, these two terms of service covering the whole existence of the Dental School down to 1904. He was a member of the first class that graduated in the Dental

(*) This operation of Cleft Palate Dr. Fillebrown performed nearly 400 times. Fully one-half of these operations were performed for charity patients.

School, the Class of 1869, and in the very year that he was appointed to a Harvard Professorship he obtained from Bowdoin College the degree of Doctor of Medicine, which at that time was held by few dentists.

"Professor Fillebrown was practising in Portland when first appointed, and maintained a practice there during most of his period of service to the Dental School. His devotion to teaching and to the conduct of his department cost him much more time and labor than it would have, had he lived in Boston; but he always maintained a strong interest in all the work of his department—his own and that of others—and never avoided either labor or responsibility. He gradually extended his own field of work to surgical operations upon other parts of the mouth than the teeth, and ultimately acquired a high degree of skill in the operations to remedy cleft palate, and to repair broken jaws and noses and other accidental injuries to the bones of the face. It was in order to recognize his knowledge and skill in this direction that the title of his Professorship was changed in 1897 from that of Operative Dentistry to that of Oral Surgery. He was a pioneer in acquiring for the profession of dentistry this extension of ordinary dental practice, and his work in this respect has proved to be durable. The best hospitals now employ dentists for operations of this class, and for the subsequent treatment.

"The whole of Dr. Fillebrown's term of service in the Harvard Dental School fell within my observation, and I am glad to bear testimony to his fidelity, zeal, and progressive spirit as an operator and teacher."

I want to refer to the charity work of Dr. Fillebrown, and I know of no better way than to give you this quotation from a letter to me from Mrs. Fillebrown.

"I think it would be well to give a little attention to his wide charities and the entire lack of desire of monetary gain. His books, the pages of which are well marked by the word 'charity,' or 'no bill sent,' attest this. I have never in all his long practice known him to refuse his services to those unable to pay. His great heart went out to all sometimes to his detriment. I learned that a surgeon asked why he did not leave a fortune to his family, as successful a surgeon as he was. I who know him best never heard him express a wish to amass

money, but always if he could accomplish some result in his profession he would be happy."

These are some of the really great things he did, and I want to go over a partial list of the things that he did in his professional career that you may again think what manner of a man this was that was removed from our midst.

Dr. Fillebrown was graduated from Wesleyan College in 1857. He received the degree of D. M. D. from Harvard in 1869, graduating with the first class in dentistry ever graduated from that University.

He took the degree of M. D. from the Maine Medical School in 1883, keeping up a full dental practice while studying for this degree.

He was elected Professor of Operative Dentistry, Harvard University in 1883 and served to 1897, when his title was changed to Professor of Operative Dentistry and Oral Surgery, and as such he served until his retirement in 1904. He was an active member of the Maine Dental Society from its organization to 1901, being one of the dentists that issued the call for the meeting at which the Society was formed at Brunswick, Me., in 1866.

Honorary member of same from 1901 to death.

First Secretary and from 1866 to 1869.

Chairman of Committee from this Society to draft a state law for the registration of dentists in 1868.

Vice President same 1869, President, 1870; treasurer, 1873 to 1875, and Librarian from 1875 to 1882.

Delegate to American Dental Association from same Society 1876-78.

Corresponding member Massachusetts Dental Society, 1885-1888.

Active member same 1888 to 1908.

Member Executive Committee North Metropolitan District, 1899-1900.

Member Harvard Dental Alumni Association, 1871-1899.

President Harvard Dental Alumni Association, 1873-1874.

Vice-President Harvard Dental Alumni Association, 1872-1873.

Honorary member Harvard Dental Alumni Association, 1899 to death.

Active member American Academy of Dental Science, 1875-1908.

Member Executive Committee American Academy of Dental Science, 1890.

President American Academy of Dental Science, 1907 to death.

Member National Dental Association.

First Vice-President National Dental Association, 1896.

President National Dental Association, 1897, being elected first President when re-organization took place.

Member of World's Columbian Dental Congress at Chicago, Ill., in 1893.

Member of Committee on invitation of same.

Member Fourth International Dental Congress at St. Louis, 1904.

Honorary Vice-President International Dental Congress at St. Louis.

Chairman of Committee on Care of the Teeth of the Poor at some convention.

Member Northeastern Dental Association.

Member Maine Medical Society.

Member Massachusetts Medical Society.

Member American Medical Association.

Member New England Dental Society.

President New England Dental Society, 1882-83.

Registered by Massachusetts (1887) and Maine (1891) Boards of Registration in Dentistry.

Registered by Massachusetts (1894) and Maine (1895) Boards of Registration in Medicine.

A member of the Dental Protective Association of the United States.

Member of the Maine Academy of Medicine and Science and President of the section on Stomatology of this Academy.

Member of the Harvard Club in Maine, and of the Maine and Massachusetts Societies of the Sons of the American Revolution.

Member of the Boston Art Club.

Member of the Society for Physical Research.

Member of International Association of Stomatology.

Turning to the papers written by Dr. Fillebrown we find

that in 1869 he read his first professional paper, of which there is record, before the Maine Dental Society, and I think this was the first paper read before this Society by one of its members. It was the usual custom before this to have some noted dentist from out the state deliver a lecture or else subjects were assigned and a general discussion held.

In February, 1869, at Bath, Me., then, Dr. Fillebrown read a paper on "Causes of Impaired Dentition," and on August 17 of same year another at Winthrop, Me., on "Anaesthesia."

1871, August 15, at Lewiston, Me., he delivered the President's address before the Maine Dental Society.

1873, February 18. an "Essay upon the Manipulation of Gold Foil," before Maine Dental Society. Published in *Cosmos*, vol. 15, page 140.

1874, March 11, at Thomaston, Me., "Anaesthetics and Anaesthesia," before Maine Dental Society.

1876, May 26, "Medical Education," before New England Dental Society.

1877, August 21, at Portland, "A History of Continuous Gum Work," before Maine Dental Society.

"Report on Dental Education" read before American Dental Association.

1878, July 16, "Development of the Teeth," before Maine Dental Society.

1881, May 5, "Equilibration as Effected by the Teeth," before New England Dental Society.

1882, October 5, "Irregularities," before New England Dental Society.

1884, February 19, "Gold as a Filling Material and its Manipulation," read before the New York Odontological Society. Published in *Dental Cosmos* May, 1884.

1885, January 7, "The Use of the Key," before American Academy of Dental Science in Boston. Published in *Cosmos*, Vol. 27, page 69.

1886, "Riggs Disease," before Maine Dental Society, at Lewiston.

"Temporary Enlargement of the Parotid Gland." Published in *Archives of Dentistry*, February, 1886.

"The Influence of Culture on Professional Skill," read before the Massachusetts Dental Society, December 9. Published in *Independent Practitioner*.

1887, July 19, "Bridge Work," before Maine Dental Society, at Waterville, Me.

Discussion on a paper on "Management of Pulpless Teeth." Before International Medical Congress, Washington, D. C.

1888, July 17, "The Philosophy of Speech," before Maine Dental Society at Portland, Me.

"The Relation of the Teeth and Palate to Vocalism," read before the Union Meeting of the Connecticut Valley and Massachusetts Dental Societies at Boston. Published in *Independent Practitioner*. This paper was published by Oliver Ditson Co., the music publishers of Boston, under the title, "Development of the Human Voice for Speaking and Singing, 1909."

1889, "A Text Book of Operative Dentistry." Written by invitation of the National Association of Dental Faculties.

"A New Operation for Excision of the Inferior Dental Nerve." Read before the Maine Dental Society at Skowhegan, Me.

1890, "Operation on Hare Lip" and also "Progress of Dental Surgery." Both read before Maine Medical Society at Portland, Me., February 6.

1891, "Vitality as a Germicide." Read before the American Academy of Dental Science, Boston, Mass., June 3, and published in the *International Dental Journal*, October, 1891.

1892, "Hypnotism as Applied to Dentistry." Read before Maine Dental Society, at Portland, Me. Also read before Massachusetts Dental Society.

1893, "Hypnotic Suggestion as an Obtundent and Sedative." Read in open congress before the World's Columbian Dental Congress at Chicago, Ill., and published in transactions of same.

"A New Apparatus for Continued Anaesthesia While Operating on or in the Mouth." Read before World's Columbian Dental Congress. This apparatus was also shown before the Academy of Stomatology, Philadelphia, 1895. Published in transactions World's Columbian Dental Congress; also *Dental Cosmos*, Vol. 37, page 1007; also *International Dental Journal*, Vol. 16, page 731.

1894, "Report on Oral Surgery and Anaesthesia." Read before Maine Dental Society, Rockland.

"History of the Discovery of Modern Anaesthesia." Read at the Semi-Centennial of Modern Anaesthesia at Philadelphia, December 11, 1904, and published in *Cosmos*, Vol. 37, page 69, and in *International Dental Journal*, Vol. 16, page 1.

"The Power of Suggestion." Read before the Vermont State Dental Association in March and published in the *Ohio Dental Journal*.

1895, "Staphyloraphy vs. Obturators." Read before Maine Dental Society at Bangor.

1896, "A Study of the Relation of the Frontal Sinus to the Antrum." Read before Maine Dental Society at Portland; also read before the American Dental Association same year, and published in *Cosmos*, Vol. 38, page 903, and in the *International Dental Journal*, January, 1897.

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1898, "A Secondary Operation for Hare Lip." Read before the Academy of Dental Science at Boston, Mass. Published in the *International Dental Journal*, September, 1898.

"Some Modifications of the Operation for Closing Congenital Fissures of the Palate." Read before the Surgical Section of the Suffolk District Medical Society, and published in the *Boston Medical and Surgical Journal*, February 3, 1898.

"President's Address—The Value of Organization." Read before the National Dental Association, Omaha, Neb., August 30, 1898, and published in *Dental Cosmos*, Vol. 40, page 867.

1899. "Hare Lip and Cleft Palate." Read before the National Dental Association, and published in *Dental Cosmos*, Vol. 41, page 1130.

"A Fatal Case of Haemophilia." Read before the American Academy of Dental Science, December 6, and published in *International Dental Journal*, Vol. 21, page 302.

1901, "Notes on Obtundents." Read before the Maine Dental Society at Old Orchard, Me.

"Action of the Larynx in Relation to the Pitch of the Voice." Read before Boston Society of Medical Sciences January 15. Published in the *Journal of the Boston Society of Medical Sciences*.

1902, "Physiological Results of Operation for Cleft Palate." Read before American Academy of Dental Science, February 5, and published in *International Dental Journal*, Vol. 23, page 557.

1904, "Anaesthesia for Oral Operations." Presented to Section 5 of the Fourth International Dental Congress at St. Louis, Mo., September 1, 1904, and published in the transactions of this Congress and in the *Dental Cosmos*, Vol. 47, page 310.

"On the Care of the Teeth of the Poor." The report of the Chairman of the Committee on the Care of the Teeth of the Poor, presented to Section 4 Fourth International Dental Congress, and published in its transactions.

1905, "Three Cases of Oral Surgery." Read before American Academy, February 1, and published in *International Journal Dental Science*, Vol. 26, page 722.

I do not pretend that this is a complete record of the professional life of Dr. Fillebrown. I tried shortly before the death of Dr. Fillebrown to get him to give me the details of his life, but it was too late. He wrote me that he found himself "in such condition that he had, of necessity, to refrain from all work that was not pressing."

This list of the things he has done is complete enough, however, to impress you with my estimate of the man as one who did things. And you will remember all the time he was doing these things, he was engaged in the daily toil of bread winning. He was not a wealthy man that he could devote long hours from his dental practice to these matters, no state or university granted him a pension on which to work and live. All this was done in the time that you and I play, rest or idle away.

It seems to me that as I think of Dr. Fillebrown, I always also think of that other great Maine dentist that I have men-

tioned, Dr. Elbridge Bacon. They were very different men in character, and yet what a debt of gratitude we, in our profession in Maine, owe these two men. How intimately dentistry in Maine is connected with the names of these two men in the last half of the century just passed. I cannot conceive that dentistry, in my state, could possibly have reached its present position if either of these men had not lived, they supplemented each other to such a degree.

A time ago I was requested to name the pioneer of dentistry that had done the most for dentistry in Maine, and I named Dr. Bacon, and for these reasons: In the first place, he was an older man than Dr. Fillebrown, and in that sense more of a pioneer. And in the second place, it seemed to me what dentistry needed fifty years ago, was such an uplifting as only such a kindly spirit as Dr. Bacon's could and did give it.

A profession that could attract such a nature must be thought more of because of that fact, and Dr. Bacon in all his life so lived that one was compelled to think more of a profession that contained him.

This I think meant every thing to dentistry in these early days, and even today our profession must be judged by the kind of men that compose it. Well if today it attracts such natures as that of Elbridge Bacon. But Dr. Bacon could not do the things that Dr. Fillebrown could do. He had not that inexhaustive vitality that could work day and night, without end. One of my patients has told me that even when Dr. Fillebrown first came to Portland he had that look in his eyes of a man that sees something ahead that he must do. It surely was his soul looking out of its windows. It was not enough that Dr. Bacon should elevate the regard in which men of our profession was to be held, Dr. Fillebrown must show them works that demanded and held their attention. Brilliant operations—daring ones, these attracted the layman's, the dentist's and the physician's attention, and people said this young profession of dentistry is a noble one. And some of them gave their most promising sons to it that it might continue. Again I say to you it was because, more than anything else, that Dr. Fillebrown and Dr. Bacon lived and practiced that this was so in my state.

And so to you younger men especially, I want to say this—Think of the beauty of the lives of these two men, think of the

inheritance they have left you and go home and resolve that because these men have lived and died and enriched your profession, you will do nothing but what they would think well of, so that your lives will always be a tribute to their lives. Then I assure you if ever in eternity it shall be your privilege to again meet the soul of Dr. Fillebrown or of Dr. Bacon, they will say to you: "I am glad I lived and furnished a life that was an inspiration for you." This is the greatest tribute we can pay to them—to appreciate them, and to so order our lives that they will approve.

DENTAL HYGIENE: ITS REAL SIGNIFICANCE.*

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Until very recently the necessity of caring for the mouth and teeth of children has not been a matter of public interest. An important part of medical inspection in schools has been neglected. Medical school-inspection is the most important work carried on by departments of health; it is one of the most important functions of the state. Only within the year just passed has Dental Hygiene and its urgent need received any serious attention in this country. By its practice the general public health can be greatly augmented. In the fight against tuberculosis it is a factor of the first importance. Dental Hygiene is the practical application of dental science to the individual, the home and the school. Public interest in the care of the teeth must be created. Everybody should know that the general health of the individual and of the community depends largely upon the condition of the mouth and teeth; that the highest efficiency and happiness in life can not be gained when the gateway to the body is neglected.

To attempt to force an inspection of the teeth of school children as an arbitrary demand is unwise. It would be opposed by children and parents as unwarrantable interference;

*Read before The New York Institute of Stomatology, March 2, 1909; and at the Rhode Island State Conference on Dental and Oral Hygiene, Providence, April 2, 1909.

and this movement which has so fair and favorable a start would be shorn of half its breadth. To open and maintain a vigorous campaign of popular education in oral and dental hygiene is the first step. The public should be instructed and educated so that dental inspection in the schools will be demanded. It is unwise to push too vigorously the spoken and written propaganda. Each advance in human knowledge should be deliberate and cautious. More than one good cause has miscarried because a faint interest has been forced into an enthusiastic demand. Always it is the better method to encourage only a reasonable and steady growth. This method works broad, deep and increasingly effective benefits. It should be our earnest endeavor not to let our enthusiasm lead us into exaggeration. It is never wise to tell any more of the truth than will be believed—an old saying and a wise one. We need to keep an even keel and our rudder true. Back of this great crusade for health which is on foot all over the country is a faith in humanity and a belief and a confidence which animates it. An enthusiasm is merely temporary; it is short-lived unless there is behind it some persistent and tireless force. In the crusade for better care of the mouth and teeth the Dental Hygiene Councils are this force. There are now three Councils—the Massachusetts, the New York and the Rhode Island. This crusade is practical and concrete; and it wears the hall-work of plausible simplicity. Such a movement grows. It accumulates force.

In order to make clearer than ever before the fact that a clean mouth is closely related to efficient living; and to bring an illuminating and close-range vision upon its importance, the recent Boston Conference on Oral and Dental Hygiene was planned and accomplished. This conference was noteworthy in that it is the first series of meetings to go on record as giving serious and exclusive consideration to the care and use of the mouth and teeth. The dentist, the physician, the nurse, the social worker, the educator, the teacher, the sanitarian and the layman—each and all gave to the public at these meetings first-hand and convincing testimony that much preventable and wasteful damage to health, efficiency and happiness now comes from the neglect of the gateway to the body—the mouth and teeth. In “The Call to Public Health” the dentist up to within very recently has not been summoned. But now a clear summons

comes for him; and the responsibility and the part he is to play in the prevention of disease and the prolongation of life stand in his path of public duty. He knows better than does anyone else the havoc that neglect and decay of the teeth is working; and the alarming prevalence of disease and inefficiency resulting from it—a wanton waste which can be greatly checked. Every other organ of the body is safeguarded with the minutest care; and helped to perform its particular function, and saved. The teeth alone are neglected and oftentimes knowingly sacrificed. And yet, the fact is, decayed, diseased and inefficient teeth are important factors in the origin of many diseases, besides being in themselves the first cause of much ill-health with the resulting loss of time and money.

Never has there been any organized attempt to prevent dental decay and disease. Forty thousand dentists in this country are kept busy making repairs on teeth in which decay has not been prevented—only somewhat retarded—or making substitutes for those which have been lost through neglect; and that, too, for the relatively few who are able and willing to pay generous fees. All those who buy this work practice cleanliness, and make an effort to follow the advice given them that they may save their teeth. The great mass of people have no instruction in the necessity of cleanliness and do not practice dental hygiene. They have no repairs made; they have no resort but submission to the forceps, when pain-driven. No definite knowledge exists as to the prevention, predisposition or immunity to dental disease; no closer knowledge than that cleanliness is obtained by brush and powder or paste. Dentists themselves must acknowledge that their efforts at prevention at best are but partial; these efforts are inadequate to hinder appreciably destructive processes upon the teeth and health. The situation demands concerted and organized efforts to add to this knowledge; it calls for scientific investigation to be undertaken to discover the relation of the oral secretions to the mouth; to determine the reactions which favor or restrain the processes of decay or erosion; and to determine the general bodily conditions causing variations in those secretions. This is a part of Dental Hygiene which falls particularly to the dentist. Important facts can be revealed by patient and organized research work.

The far-reaching relations of dental health or disease to

health or disease in general are very little appreciated. The teeth lie at the gateway of the alimentary canal and their use or abuse makes the first step in the process of digestion and assimilation. Upon that step, whether it is the right one or wrong one, everything depends. A wrong first step causes vicious and unmendable damage. The fact that dental decay is so common in civilized man, far more common than in uncivilized man or animals, is the weightiest of evidence that there is something wrong with what men eat, how they eat it, or both these conditions. Among civilized people the average man eats without sufficient mastication. He tries to avoid the necessity of deliberate chewing by having his food prepared in pulverized, liquefied or pappified form. He invents machines for grinding food; and he concocts appetizing liquids to "wash down" his nourishment. He hangs over himself the great pressure of time; he lives by the clock. Engagements and appointments at fixed hours are kept at the cost of abbreviating his meal times. He eats too fast—a fact that is emphasized by the few who eat slowly generally having better teeth. Through hurried and incomplete mastication he reduces his general health and his efficiency. Individual and national efficiency is the foundation upon which government and progress rest. It is from the economic point of view that dental hygiene demands first consideration. The working power even of the so-called "well-man" is but a small fraction of what it might become if all the factors which make for increased efficiency could be fully utilized. Mastication takes an important place among these influences.

Prevention is a good investment; there is no sounder or more profitable investment anywhere. At a recent meeting of the Association of Life Insurance Presidents in New York city, Prof. Irving Fisher, of Yale University, said that it is sound business for the life insurance companies to work for the prevention of disease, just as it is sound business for a fire company to work for prevention of fires. By this method the insurance companies will increase the lives of their policy holders; they will be financial gainers. One-third of all the deaths that occur could be postponed, and an average of from eight to fifteen years could be added to life by simply teaching the necessity for hygienic living and good sanitation. "Life insurance is not a philanthropy," said Prof. Fisher, "it is a beneficent business.

By far the largest cost of insurance today comes from mortality. Reduced mortality would be a saving of a large percentage in money paid out. If the casualty companies work for improved safety why should not the life insurance companies work for improved hygiene?" Fewer men would be suddenly stricken dead in the prime of life had closer attention been given to the care of their mouths and teeth. More than one death from pneumonia after an operation would have been prevented had the condition of the mouth been considered before the operation was undertaken.

The great wave of enthusiasm for health reform now spreading over the country and the world, and particularly the interest in the subject of diet and thorough mastication, gives a great opportunity for dentists to co-operate in this good work of which they will not be slow to avail themselves. The opportunity is not one for making larger or more numerous professional fees. Dentists, like medical men, make best progress in their profession by doing work which tends to dispense with their services. Many dentists today are turning with enthusiasm from the old habit of merely mending defective teeth to prophylaxis. The most important message which the dentists have to give is the simplest—thorough mastication. The fact that there are very few of us who do not come to the dentist gives him a wonderful opportunity. Says Prof. Fisher: "A long experience in preaching hygiene convinces me that the psychologic moment to interest the unbeliever is when he is ailing. Dentists have their patients at just such moments when they are especially willing to listen to good advice in order to avoid the aches, expense and time lost by neglecting their teeth. If every dentist in the United States had in his office standard leaflets on the care and use of the teeth, including thorough mastication, the good which could be accomplished with millions of patients, and through them with tens of millions in their families would be incalculable."

A community can make no better use of its tax-payer's money than to afford him the protection which health inspection of school children gives. The care of the child is the conspicuous subject of the year. The care of the teeth is an important factor in the care of the child. Soon school health-inspection will be the rule in every city and town. The mental and physical

efficiency of school children can be greatly augmented by the proper care of the mouth and teeth. This is fully attested by the experience in Germany—an experience which covers a wide field. Dental infirmaries connected with the schools have been in operation in that country for a sufficient length of time to demonstrate:—

First: That the time expended in putting the teeth in order was far less than the time formerly lost from toothache and disability caused by diseased teeth.

Second: That the cost of keeping the teeth in order was more than compensated for by better health and a consequent reduction in hospital expenses.

Third: That the child became physically stronger, secured a higher average in his studies, was easier to control and was apparently happier.

Diseased teeth are a fruitful cause of disturbances in other parts of the body; and hygiene of the mouth has a direct connection with as well as a controlling influence over the health of every individual.

Nearly every form of bacteria benign or evil at some time gets into the human mouth. The healthy gastric juice destroys bacteria. Therefore, it is important that the stomach should be in a healthy condition. It is necessary not only for a healthy condition of the stomach, but also that bacteria may be destroyed by its secretions that the food is finely ground by the teeth before entering the stomach. Perfectly healthy epithelial tissue offers strong resistance to bacteria; and it is difficult, if not impossible, for bacteria to pass through it. Epithelial tissue is the membrane which lines the entire alimentary tract. So long as this lining is in a healthy condition there is less danger of disease germs passing through into the circulation and causing disease. If by reason of diseased teeth the lining membrane of the mouth is irritated and becomes unhealthy; or if by reason of indigestion or a lowering of vitality by cold or excessive nervous strain, by sudden changes in temperature, or by any of the causes which disturb the equilibrium of the body, the tone of the mucous membrane of the mouth, tonsils, and other portions of the alimentary tract is lowered, the entrance of disease germs or their toxins is rendered possible.

Soil and surroundings make a very great difference in the growth of plants whether they are of the higher vegetable world or belong to the almost sub-microscopic order known as bacteria. Disease germs found in filthy mouths which contain broken down and diseased teeth are usually intensely virulent. When those same mouths are cleaned and the diseased teeth filled and treated; and when following treatment the mouth is kept in a clean and healthy condition many of the bacteria disappear. And those which remain lose in a marked degree their virulence and activity. A clean mouth and sound teeth furnish one of the best protections against disease. A diseased condition of the ears or eyes may be due to bad teeth. The serious diseases of the bony cavities of the facial bones, and swelling of the glands of the neck are often dependent upon dental disease.

Between the sixth and twelfth years is a period when the teeth need especial care. In these first teeth decay proceeds rapidly. Nutrition is interfered with and the purulent discharges from diseased teeth and roots lower the vitality and make the child more susceptible to the invasion of infectious diseases. A child forced to swallow the discharges from an unclean mouth and having nutrition interfered with by his inability to chew his food is less able to resist disease. One of the reasons why the children of the poorer districts of a community succumb more readily to infectious diseases than do the more favored children of the well-to-do classes is that their parents have neither the money nor the time to see that the teeth are properly cared for; nor have they learned the importance of such care. Disease germs find a ready entrance into these mouths and a suitable place for growth. It is altogether probable that a more general attention to the hygiene of the mouth will result in reducing the number of cases of infectious diseases among children and particularly with the children in the public schools.

Thorough mastication prevents over-eating and the eating of unsuitable food. Besides the effect upon digestion and assimilation the effect on the teeth themselves is important. Decay is hindered in the mouths of those who eat slowly. In such mouths the teeth are kept clean and well polished; and in children the facial bones and muscles are developed by the exercise of chewing. The teeth and the jaws need exercise for their perfect development just as much as the arms need it. Instruc-

tion in this particular and insistence upon its importance should go hand in hand with instruction in the use of the tooth brush.

Dr. William H. Potter has well said: "That whereas the process of restoring decayed and diseased teeth usually called for the expenditure of more time and discomfort than was required to restore other organs to normal condition we have the advantage of being able to do more in the way of prevention. In a majority of instances when the eyes or ears are affected speedy relief may be given them, but it is difficult to apply measures of prevention. In the case of tooth-decay a great deal can be done in the way of prevention; and as an economic measure we must apply our intelligence and our forces largely to this end."

Children should learn to eat slowly, and in time they will acquire or return to the habit. The condition of the teeth is a tell-tale as to diet. They are the guards which stand at the gateway to the body ready to divide the food which enters into manageable portions, to bring peace of mind and healthful bodily activity. No greater killjoy exists than dyspepsia; no more vicious a menace to life and efficiency obtains than a disordered condition of the process of nutrition. Among physicians there exists a disregard for the teeth as organs to be reckoned with medically. Many a case of dyspepsia is due to defective teeth. Dental irritation is of very considerable importance in affections of the intestinal tract. Affections of sensation, of motion and of nutrition may all be dependent upon dental irritation. Even the cerebral faculties themselves may suffer from this cause. The reflex nervous conditions in children—fretfulness, fever, convulsions—are generally ascribed to digestive disorders, and not to teething or tooth-rot. Teething is nothing but teeth is the general belief.

Mastication divides food into small particles so that it can be readily acted upon by the digestive juices. Chewing of food causes the flow of saliva, and in turn the action of saliva causes the food to taste agreeably. Pleasant taste of food in the mouth produces a flow of the digestive juices of the stomach so that the stomach is prepared to carry on its part in digestion. In the pouch of the stomach starchy foods, if well chewed, continue to be digested by the saliva; if not well chewed they may undergo fermentation with the production of gases, and not only are lost to

the body but interfere with the natural processes of digestion. In the small churning part of the stomach pieces of food which have not been thoroughly chewed must be rubbed by the walls of the stomach until softened and made ready to be discharged into the intestines. The soft lining of the stomach is not suited for this work which the teeth should do. It is perhaps significant that the churning end of the stomach, so likely to be injured, is the seat of gastric ulcer and cancer.

In the question of infection air infection is held to be of minor importance. Air infection means infection through the respiratory tract—entrance through the nose. Excluding the respiratory tract as the important entrance of infection we are compelled to conclude that the gastro-intestinal tract with the mouth as its gateway is the avenue through which most disease-producing bacteria make their way into the body. The work of the French hospitals indicates that we must include in the class of infections through the mouth the exanthemata, smallpox, scarlet fever, measles and chickenpox, as well as diphtheria and erysipelas. Infectious material introduced into the mouth with food or drink meets with little resistance to its growth until it enters the stomach. The saliva is poor in antiseptic qualities. The first real resistance to bacterial growth comes after food has entered the stomach where the gastric juice is secreted.

The value of the gastric juice in the destruction of bacteria depends upon two factors; its strength and an opportunity to come in contact with the bacteria. The dog bolts its food and though its stomach secretes a gastric juice having many times the strength of the human juice, it is unable to destroy a large percentage of the bacteria contained in food. The herbivora, such as rabbits, who more thoroughly masticate food show a stomach content remarkably free from bacteria. Clinical observation in man tends to establish the belief that complete mastication which results in a finely divided food-mass, favors thorough mixture with the gastric juice and enhances its activity.

Cancer of the stomach is eminently a disease of gross and rapid feeders. The part played by mechanical injury—traumatism—in the production of gastric ulcer has been demonstrated. Eighty per cent. of the cancers of the stomach start on pre-existing ulcers. A gross feeder overdistends his stomach; frequent overdistention may result in injuries to the lining membrane.

Of more importance is the bolting of food. Most of the injuries produced are readily repaired, but repeated insults are apparently less well borne. A second agency in the causation of cancer, a factor which is only now beginning to be appreciated, is the influence of physical-chemical action. It is believed that extreme variations in the osmotic pressure of the fluids which bathe mucous membranes is an important factor in the cause of cancer. Proper mastication of food corrects both of these dangers.

An exposed or irritated nerve anywhere in the human body except in the teeth is regarded, and rightly so, both by the medical man and the layman as a cause for much anxiety and the promptest possible treatment. On account of the common, almost universal occurrence of dental disease, and because the teeth during the period of their development grow through the solid framework of the jaw, a region highly innervated and clothed with a membrane sensitive to impact and to corrosive toxins they have doubtless an important relationship to the more obscure nervous derangements. This is a new field of research, and it emphasizes anew the fact that the physician and dentist should work together. There is a close relation between dental conditions and nervous diseases.

During the past year the children and a number of adults who came to my clinic for nervous diseases at the Boston Dispensary were the subject of closest observation as to their dental condition, as well as the condition of their eyes, throat, nose, heart, blood, nutrition and secretions. Full and exact records of these cases are being kept. The first step in the treatment is to have the mouth and teeth attended to so that good nutrition may be established and all dental irritation removed. One of these patients, a boy of ten years, is of particular interest: This ten year old boy is undersized and poorly developed. He was undernourished, not because of lack of good food—his parents provided amply for him. He weighed sixty-three pounds. Frequently he had seizures which bore the ear-marks of epilepsy. His heart and lungs were normal. There was general glandular enlargement. The only complaint the boy made was toothache—and this was vouchsafed only after close questioning; and his mother laid but little importance upon that fact. "Every child had toothache," she remarked. An examination of the boy's teeth showed that he did not have a sound tooth. The lower jaw

had but one six year molar on either side; the upper jaw was equipped in the same manner. All these four permanent teeth (grinders) were rotten. The boy could eat nothing but soft foods. He never tried to eat crusts of bread; and all the meat or solid foods he ate his mother first cut up into the smallest possible pieces. Most of his food he bolted; or he washed it down with liquids. In the week before his mother brought him to the clinic the boy began to develop a cough. Immediately and first of all the boy's teeth and mouth were given close attention and care. In three weeks his weight had increased to sixty-seven pounds; his seizures stopped; and his mother allowed that the boy was much improved. And she said that she was going to begin to take care of the teeth of her two younger children, one a baby—both of whom have "bad" teeth.

If an ounce of prevention is ever worth a pound of cure it is keeping the teeth in good condition. There is probably no one who sees more neglected mouths than the nurse, and particularly the district or school nurse. She brings weighty testimony as to the pressing need of a far-reaching crusade to promulgate the practice of dental hygiene. Many a desperate situation would yield more quickly to her patient administration if she were not obliged to contend with the subtle foes to health which are entrenched in the soil of the foul mouth. The nurse is trained to regard the mouth as a fertile soil for infection; and her first duty to her patient is to clean the teeth with a strong mouth-wash applied to cotton. We can imagine her feelings when she finds the mouth of a patient with tuberculosis, typhoid fever or pneumonia containing teeth that are crumbly and with large foul cavities and suppurating abscesses oozing from their roots. In the home, nursery, schools, hospital, factory—everywhere she sees the suffering and the cost from neglected mouths and teeth. She is patiently waiting for the dentist to answer his summons—"The Call to Public Health."

The readiness to make the application is just as vital in the triumph of dentistry and medicine as the readiness to go to the bottom of things to discover first causes. To make this practical application the social worker stands in the foremost rank. They are the ones who know best the real value of every day life. The science of preventive medicine has added not only to the length of life but to its breadth and depth. Every day of life

is worth at least ten or fifteen per cent. more than it was before the modern triumphs in hygiene. No one has a larger opportunity than the social worker to put new knowledge into practice, to bring the priceless information gathered by the professional man to the utmost points and depths of the community. And the social worker has the faith in humanity, the belief in the individual which is necessary to carry the gospel of hygienic righteousness into the homes so that parents can give their children their birthright—a healthy, wholesome and useful life.

The most important work among children for the betterment of their teeth must be done in the line of prevention rather than cure. Children and parents must be taught the value of the teeth and how the teeth enter into the question of physical development, and protection of the body against disease. They must be taught the importance of daily care of the teeth and how to prevent decay and pain; that decay can be prevented by keeping the teeth and mouth clean. The child must be instructed to be its own dental adviser and inspired to practice every day the simple procedures of dental hygiene. But little progress can be made in improving the condition of the teeth of school children until the initiative has been established in the individual, training the child to assume the preventive care of his own mouth and teeth. The children and the parents can be best guided into taking this first step towards hygienic and dietetic righteousness by social workers, whom they readily accept as auxiliary members of their household.

Social workers have welcomed this crusade for hygiene, and they are eagerly waiting to become working disciples and carry the gospel into every home; and to emphasize the economic and social advantages of clean, sound teeth. And social workers everywhere are ready to socialize the dentist's skill by enlisting his co-operation in social work; to "follow up" the education of parents and children; to assist in organizing and maintaining dental infirmaries; to urge upon hospitals, school boards and boards of health the necessity of preventing decayed or crippled teeth; and to help bring the physician into a keener interest in dental hygiene. Being a part in the home life of those of the community who have but limited means social workers are the most effective agents in checking dental quackery and the painless humbugery of dental parlors. And through their organiza-

tions and the influence of those who support them social workers can help dental leaders in education and journalism to establish the ethical and professional standards of the physician and the social standards of the practical philanthropist.

Every manufacturer knows that however perfect his machine is if the material that goes into it is bad he can turn out nothing but seconds; and the manufacturer has the advantage of school people in that he can put his goods on the market and label them seconds. School people cannot do this. We are beginning to learn to think that possibly there has been some trouble with the materials. Medical inspection in public schools in recent years has thrown more light upon school problems than has come from any other source. In Massachusetts there is in operation the most complete system of medical inspection of public schools that exists in this country. It is the only state that requires the appointment of school physicians in every town and city. Though no penalty is imposed upon school committees who fail to appoint school physicians, yet in 1908 in all but 21 of the 355 municipalities, towns and cities, school physicians have been appointed and have been at work. Medical inspection is revealing the fact that very large numbers of children in the public schools are suffering from physical defects and disabilities which tend to interfere with their school work, which make good school-work impossible. With all these disabilities school-work cannot be as effective as it should be. The significant fact is that the period in life when these diseases are most common in school children is when elementary facts are learned and memorized, when school habits are formed which underlie and contain all subjects of intellectual effort. It is the time when children must learn reading, writing, spelling and numbers. If they are not learned at this time, if this work is not done in the earlier years, it never can be done. Time lost here is lost forever, because if the time for drill—these earlier years—if that time is lost the mind in the years that follow has other business to attend to. Through medical inspection we are getting a flood of light upon this whole matter of public school work. Dental inspection, even the little there has been, throws still more light and throws it a little deeper into the whole system. At the Hygiene Congress in London last year reports showed that children having defective teeth are often defective in other

ways. Enlarged glands and diseases of the digestive tract are quite proportionate to the number of children with defective teeth. If it is true that the defects in the teeth are accompanied by and cause a large number of other defects which appear in the lists in medical inspection reports then it is evident that we are getting nearer the real secret of the whole trouble through dental inspection than we have been before. We are getting down to the root of things. Therefore this whole matter assumes much importance as a part of public school work, aside from its relation to general public health.

Ninety per cent. of all the school children of Germany have defective teeth. Reports this year of dental inspection in Massachusetts show no better condition. Defective teeth are causing a great variety of other diseases, many of them serious. The lesson of this matter is to get down to the seat of the trouble. The ignorance of the public is the trouble. Parents are not wilful in their neglect in most cases; they are simply ignorant. A law compelling parents to send their children to the dentist and to the surgeon is impossible. Instruction in physiology and hygiene should be a more important and fundamental part of the school work. We talk about essentials. The essentials are supposed to be certain subjects of study—reading, writing, arithmetic, and a few others of that kind. We are neglecting the essential of all essentials—a sound body. Until we can secure that it makes very little difference about the rest. Toward and along that road we are to travel in the future. That is the supreme lesson of this whole matter of health inspection.

In the application of dental hygiene to the school system care must be taken not to lose sight of the big issue, the preservation of the general health of the children. Nothing should be done to foster even in a small way over-specialization. But little definite data are available to determine conditions as to dental disease in the public schools. As a standard upon which to carry on school dental investigation the classification of Dr. William H. Potter in the Brookline public schools should be used in order that the data gathered may be of fullest value. Dr. Potter groups his examinations in three classes—good, fair and poor. No readily observable defects constitute a good condition; several small defects, or one or two sizable defects a fair condition; and all others a poor condition. In the Brookline schools

the examinations are made by dentists; and they are made in such a way as to create no disturbance in the running of the schools.

Dr. Scannell, a member of the Boston School Board, is authority for the statement that of the 100,000 school children in Boston 75,000 need dental attention; that 75 per cent of the pupils in the public schools have dental disease. These data were gathered by the school nurses. The figures undoubtedly understate the real condition, for it is but just to assume that a nurse could not make as accurate a dental examination as would a dental surgeon. The world is spending time, money and much thought on the general subject of tuberculosis, and yet the public who should be most interested in this modern scourge give little thought to the fact that unquestionably a large part of tuberculosis can be traced directly to improper mastication of the food and foul mouths.

In the Boston public schools at the present time there is no organized systematic method of inspection of the teeth. If any thorough work is to be done in dental inspection it must come from men trained in the work. A system with no particular organization, no matter how well intentioned may be the members concerned in the operation of it, must prove ineffective and unprofitable. Much good has been done in the educational way both in the school by the teachers and in the home where the nurses visit, but such benefits are too sporadic to deserve the name of system. The problem affects first the individual. Dental disease unfits him for full utilization of his bodily and mental activities. In Boston with a school population of over 100,000 children and a probable percentage of dental disease in 75% of them the matter of correction is a formidable one; it should not be undertaken lightly. The work should grow along definite lines; there should be no failure of execution. The Dental Hygiene Council has pamphlets entitled, "Care and Use of the Teeth," and "How to Care for the Mouth and Teeth and Why;" these pamphlets are written in simple, convincing English and cannot fail to promote interest in oral hygiene. Says Dr. Scannell: "I believe that the School Board should distribute these pamphlets among the school children. I believe that we should have more compulsory instruction by the teachers in this matter. It would take but a few moments each day for the teacher to

dwell on the matter of cleanliness of the teeth, and by practice and instruction teach the children under her the care and proper methods of treating the mouth. The number of school children, particularly those in the period of their first dentition who have never known the use of a tooth brush is at least 50%, and in certain districts as high as 75%. I should like to see some plan adopted similar to that in Brookline where toothbrushes are sold at cost prices to the children who are invited to bring them to school so that they may have practical demonstrations from their teachers."

Short lectures illustrated by photographs, charts and diagrams could be made a regular part of the school teaching, particularly strong emphasis being placed on the physical, mental and moral evil resulting from neglect of the teeth. The public in a short time will ask for the establishment of municipally-conducted dental service not connected with a Dental School. School Committees look for definite guidance as to the direction of their policy to advance from the deliberate and careful advice of public spirited Dental Associations.

For real human testimony as to the urgent need of better condition of school children's teeth we must listen to the teacher. It is she who speaks from her heart; whose message comes straight from the hearts of her children, the boys and girls whom she loves and whom she is striving so earnestly and patiently to help grow up into strong and happy men and women. Her appeal carries its lesson even to those who might not care to see it. In the State, the city, colleges and universities, all along the line there is to-day a wonderful quickening in public health movements. Prof. William T. Sedgwick, a foremost sanitarian, says: "I who happen to be in rather close touch with these things am astonished to see how after many years of crying in the sanitary wilderness I find the world at last waking up; universities talking of establishing public health schools; books being written on 'Civics and Health;' and movements like this in dental hygiene. The commonest of all diseases are diseases of the teeth." One of the foundations for right and happy conduct of life is a good set of teeth properly cared for. At last attention is being turned to the most important thing in the world, man himself. We are getting to believe that the care of things in this life is worth while. The value of human life is beginning to be realized. The

kingdom of health is very largely within us; and anyone who has given attention to such matters as the teeth or the feet, and to clean hands knows that these are quite as important in many ways as many another endeavor for human betterment.

The layman's foremost obligation to-day in furthering dental hygiene is not "to widen the bounds of human knowledge" but to widen the ranks of those who possess such knowledge, and "*to narrow the gap between human knowledge and human action.*" With teeth as with so many other portions of our bodies, our yards, our houses, and our morals the presence and appreciation of our neighbor are very important when not determining factors in our conduct. Neglected cleanliness almost always becomes noticeable to our neighbor, sooner or later, even though carefully concealed. There is no offense we are so reluctant to commit as that of having our uncleanness offensive to those about us. The layman's economic motive must be informed and stimulated. No regular family investment will earn more money than the price of prompt and efficient dental care. One good "house cleaning" for a girl with sixteen teeth in offensive and unsanitary condition will not only increase her immediate earning power, but can be shown to cost more than the preventive care of a whole family's teeth for ten years. No child should be allowed to go to work whose teeth cause malnutrition or disgust.

This problem of Dental Hygiene is not altogether one of benevolence. "It is in large measure," says our First Layman, President Eliot, "a problem of economics. Health is needed for great industrial production. Every case of disease involves an immediate economic loss to the community in which such events occur. This is not only a problem of benevolence, of good will towards our fellow creatures, it is in a high degree an economic problem. There is coming a great change in the practice of medicine and surgery and dentistry, and a much greater proportion of the attention of these professions is hereafter to be devoted to prevention rather than cure." In a conquering campaign against disease a pliable close-knit organization is the first need. The foundation must be firmly laid. It must be deep and broad. Then comes the wider phase when the entire profession through ways of professional fellowship acquires the new knowledge and method. Then the final vast program of creating a specific,

formulated, hygienic gospel and going out into all the world to make disciples of every fellow creature.

For many years a few individual dentists have been advocating a broader appreciation of the importance of dental hygiene. But no organized or directed efforts to promote this teaching along broad lines were undertaken until a little over a year ago. The Massachusetts Dental Hygiene Council was organized in December, 1907; and now the dental profession finds itself called upon to provide guidance for an ever growing movement for the elevation and enlargement of individual, family, community and civic life. It is the duty of every citizen no matter what his profession, business, or trade to give as much attention as he can to the public weal, and to take as much of an active part as he can in promoting public health. The dentist's opportunity has come, and every dentist who has the true professional spirit will meet his duty; and being a man he will give substantial aid willingly and generously, according as it is his privilege, in helping his fellow men profit by his knowledge and skill. Dental Hygiene is an important part of a broad, an universal movement for better care of the public health through a more complete knowledge of the conditions that promote health. The dentist must now take his active part and responsibility in the great progress for preventive medicine which is everywhere working. He must give to it his skill, his time, his money.

We have faith that dentists individually and as a profession will give this movement the earnest endorsement and support it merits. The dentist belongs to the medical profession. One of the best and surest marks of civilization is found in the attitude of its medical men; and those medical men who consider themselves a kind of glorified mechanic remain in a purely shop point of view. To no group of men and women is given a larger opportunity to render real human service than falls to the dentist and dental nurse. Through the practice of their knowledge and their services life can be made more effective, more useful and fuller. It can be lengthened in years; it can be given more enjoyment and pleasures; and some of the obstacles which prevent clean living can be levelled. The meager dental inspection which has been made has thrown a flood of light and that flood a little deeper into the problems of home and school hygiene. Facts are being discovered—great truths the momentous bearing of which

upon life and health are new to all thoughtful people. One more layer of symptom is bored through to the foundation of cause where tinkering and care must give way to prevention.

No form of practical philanthropy ever had so fair and favorable a beginning. Dental clinics can be established on a proper foundation, the patient paying a nominal charge for service received. Hospital boards and social workers are ready to co-operate with dentists in establishing and maintaining these clinics. Medical inspection of school children has been organized and put into practice; and school authorities are ready to include the examination of the teeth in school inspection, and provide instruction upon the care of the mouth and teeth. Dental and medical schools are beginning to instruct their students in oral and dental hygiene, and the important part it has in helping to increase and maintain public health. The Dental School of Harvard University has been given one thousand dollars, and a promise of more, to carry on research work in preventive dentistry; and a working fellowship has been created. In the free popular lectures on medical subjects offered to the public by medical schools and other institutions are lectures on dental hygiene. In the crusade against tuberculosis oral and dental conditions play an important part. And the spread of infectious diseases through the neglect of the mouth and teeth is a subject of growing importance.

All these broad and human activities are distinctly within the dentist's sphere. This movement should not depend entirely upon the efforts of the dentist. A class of men who are so closely engaged in office practice cannot know intimately the social, educational and economic needs; and the most effective way to meet those needs—how best to extend their work in public health. The co-operation of all workers who deal with children is necessary for the proper development of this crusade. The co-operation is ready and waiting, and eager to assist in carrying on a broad and effective work. But to be effective and to secure this co-operation the work must be made and kept absolutely impersonal. No dental school, no dental society, no individual need expect to gain anything by it.

The single motive must be a desire to help along the cause and a willingness to sacrifice personal interest. There must be maintained a spirit that will be above all small jealousies and petty strifes. A sustaining faith is needed, a faith that will surmount

all difficulties and rise above all discouragements; a faith that will lose sight of the individual in an earnest endeavor to do God's work in improving the physical and moral condition of His children. Upon all such workers the Dental Hygiene Councils will bestow their unqualified endorsement and give their heartiest assistance.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A regular meeting of the Institute was held Tuesday evening, February 2d, 1909, at the Academy of Medicine, New York City.

The President, Dr. Kimball, occupied the chair.

The minutes of the last meeting were read and approved.

The President—The committee appointed at the December meeting, to examine the Tuberculosis Exhibit in this city, consisting of Dr. Leo Green and Dr. Swift, have a report, which the Secretary will read.

Mr. President and Gentlemen of The New York Institute of Stomatology:

The requirements which limit this committee to a brief report upon the Tuberculosis Exhibit at the Museum of Natural History, render our task a rather difficult one, because of the extensive character of the exhibit.

This exhibit was designed to present to the public in a graphic manner the ravages of tuberculosis upon the human body, its communicable character, the methods of treatment, and the possibilities of effecting a cure, if the disease be checked in time; and while it is instructive for the professional men, its non-technical character makes it particularly impressive to the lay visitor.

In a general way the exhibit is divided into national sections. Each section presents by means of charts, photographs and plastic models, a variety of isolation camps, methods of home treatment, dietaries, simple rules to be observed in the care of tubercular invalids, and methods of preventing the spread of the disease. The United States Department of Agriculture also presents a series of human and animal organs exhibiting the ravages of the disease in its various stages.

Some of the very instructive features were a room in the slums before and after the visit of a district nurse; some hastily

constructed outdoor sleeping rooms, and the American and German methods of the care of cow's milk. The Straus method of milk pasteurization recommends itself because of its simplicity and thoroughness.

The one feature of this remarkable exhibit which your committee feels called upon to criticize, is the lack of attention given to the dental and oral aspect of the question. Aside from the mention given to the care of the mouth, in the German exhibit (referred to in a paper read before the First District Society some months ago) the care of the mouth and teeth seemed to have been entirely overlooked. For a nation which pretends to lead the world in dental science, our faults of omission in this respect are glaring.

Among the trades and professions, stone-cutters seem to be most prone and bankers least subject to tubercular infection. As a distinct profession we are not mentioned in this otherwise comprehensive classification. But, assuming that the intent is to include us in the medical class, if we were to start on a stroll from the Grand Central Depot eastward, passing on our way victims of tuberculosis placed a yard apart, we would be within a short distance of New Haven before we came across a physician or dentist in the line.

(Signed),

ARTHUR L. SWIFT,
LEO GREEN, *Chairman*.

Dr. Howe moved that the report be received with thanks, and placed in the hands of the Publication Committee. The motion was carried.

Dr. S. E. Davenport—An important letter has been received by the Publication Committee of the Institute from the Committee on Journal appointed by the National Dental Association at its meeting in Boston last summer, and is as follows:

"12 West 46th Street, N. Y. City, Feb. 2, 1909.

"Dr. S. E. Davenport, Chairman Publication Committee, The New York Institute of Stomatology:

"DEAR DR. DAVENPORT:—At a recent meeting of the Committee on Dental Journal of the N. D. A., it was decided to ask the societies publishing the 'Journal of the Allied Societies' on what terms they were willing to turn that journal over to the National Dental Association.

"In order for the N. D. A. to consider this, some knowledge of the terms required, if it is thought desirable to consider the proposition, must be ready prior to the meeting of the National Association, March 28th. I suggested that the Allied Societies would probably be very glad to turn their Journal over to the National on terms that would retain the rights of each Society, at present interested, to publish its proceedings without further editing, etc., and an assurance that the present ethical standard of the Journal would be maintained in the future.

"May I ask the Institute for an immediate expression of opinion on its attitude in this matter, in order to permit the various Boston societies time to act at an early date.

"Sincerely yours,

"HERBERT L. WHEELER,

"Chairman of National Committee on Journal."

The Publication Committee has thought this too important to decide as a committee, and therefore presents the following motion for the purpose of bringing the matter squarely before the Society:

"*Moved*, That The New York Institute of Stomatology favors the establishment of a dental journal by the National Dental Association, and will do everything possible to further the interests of such journal. It will favor the union of the Journal of the Allied Societies with the new magazine of the National Dental Association, if terms satisfactory to the National Dental Association and all of the Allied Societies can be arranged. The Institute would require that the new journal maintain the ethical standards of the Journal of the Allied Societies; that only such advertisements will be accepted as conform to the rules governing that department of the Journal of the American Medical Association, and that all the present allied societies be granted space for the publication of their proceedings as prepared by their own editors."

The motion was seconded, and the President invited discussion.

Dr. H. L. Wheeler—The meeting of the National Committee occurred last Saturday, and among the ideas brought before it was that of taking over the Journal of the Allied Societies if it could be arranged between the societies now publishing it and the

National Association. The reason for putting it so hurriedly before the Institute is that we wish to secure prompt action by the Boston societies, there being less than eight weeks before the National meeting. It seems to me if the terms can be agreed upon, that the taking over of this Journal by the National Association would be an advantage to all concerned. It will take the burden off the shoulders of men who are now giving their time and service gratuitously for the love of the work; it will give the proceedings of the Allied Societies a wider circulation, and it will unite the various forces who are desirous of establishing a journal, that will be entirely under the control of the profession. All those things are in its favor, I think, and from the spirit and opinion of all the members of the committee, as expressed at our meeting, I believe it will not be impossible to arrive at some arrangement whereby this can be done, if the societies publishing the Journal wish to do so.

Dr. Howe—It appears by the terms of the motion that this is not final action. It is a motion favoring the plan as suggested, and goes out as an expression of our feeling, provided terms are arranged satisfactory to all the organizations interested in the movement. The terms and arrangements will have to be gone over again, of course, and final agreement made.

Dr. E. A. Bogue—Can the Institute “require”?

The President—It seems to me that the Institute can “require” as a condition that whoever comes in with us shall agree to conform to the standard we have set.

Dr. Bogue—Does Dr. Wheeler know whether this motion would be acceptable to the committee of which he is chairman?

Dr. Wheeler—I cannot say that until they have discussed it among themselves. The feeling expressed at the meeting was that all present were strongly in favor of maintaining the ethical standard of the Journal of the Allied Societies. The arrangements made by the societies now publishing it were admitted to be somewhat complex, and our committee will need to go over the matter carefully with committees from the other societies. There are a lot of small questions that must be considered, but what we desire to know now is whether the Allied Societies wish to combine with the National Association for the purpose of making one strong journal.

Dr. Bogue—I notice Dr. Wheeler used the word “desire.”

Dr. Davenport—I would like to call Dr. Bogue's attention to the fact that this is not an overture made to the National Dental Association by the Allied Societies, but is in reply to an overture from the committee of that body. On their side there is the possibility of a journal. On our side there is an established journal on a basis, which some of us think to be fairly high and ethical, with a circulation of 1,500 copies, and a very large hope in our minds that it will be double that before very long. It would seem to me that under the circumstances the Institute and the other societies of the alliance may well "require" a continuance of what has been established, and what the Allied Societies have proved to be, in a measure at least, successful.

Dr. Howe—I would say in confirmation of what Dr. Davenport has said, that the requirements that have been established in connection with the journal in which we publish our transactions have been established after due consideration. The Institute started with the intention of publishing its proceedings in a journal, by itself,—if no one joined,—and establishing standards that were satisfactory to itself. We were joined by other organizations, and they have agreed upon standards. The result of the management that has been in control of the journal has caused a steady improvement in its position, and in its expectation, and there is no reason in the world why we should do anything less than "require" that standards that we have deliberately settled on should be followed; if others choose to establish different standards they can do so, and we will maintain our's if we so decide.

The President—The three requirements of the motion are fundamental; we have adopted them after careful consideration and discussion, and we should not go back upon them. In answering such an overture as has been made, it is proper to state those as requirements. I think that is the proper position we should take.

Dr. F. C. Brush—One of the requirements I notice is that the Allied Societies shall have space for the publication of their proceedings. Can we not conceive of the time when the National Association, covering the entire country, will be in receipt of papers that will be of far more interest and value than our proceedings? Must these be excluded for the benefit of the proceedings of this society?

Dr. Wm. B. Dunning—I do not see why such a contingency should arise. It seems to me highly proper that the Institute and the Allied Societies should expect their proceedings to be perpetually published, and I see no reason why they should not be.

Dr. L. C. Leroy—Is there not a possibility of the expansion of the Journal to include many other societies, and make the undertaking rather unwieldy? It is proposed to be constituted of the proceedings of the National Association and the Allied Societies, but is it not possible that many or all other societies throughout the country having representation in the National Association may consider it their constitutional right to request or demand that they be given space in that Journal, too?

The President—That proposition would have to be met as it comes up. It is not before us now. The question is whether the societies who have gone into this, and expect to keep it up, are to be cut out by union with any other body whatever. It seems fair to those who have stood by in this not to think for a moment that the space required by one of them should be cut out. If there is more material, let the new journal be expanded.

The motion was carried.

The President—If it be agreeable to the Society, I will leave this matter in the hands of the Publication Committee, to arrange and report to us.

Dr. Wheeler read a communication from the Editor of the Journal of the American Medical Association, expressing pleasure at the ethical course adopted by the Journal of the Allied Societies.

Dr. B. E. Dahlgren then made an address, his subject being "The Influence of Darwin."

DISCUSSION OF DR. DAHLGREN'S ADDRESS.

Dr. F. C. Kemple—When Dr. Merritt asked me to open the discussion on Dr. Dahlgren's paper he said there would probably not be much opportunity for controversy. I think all will agree that Dr. Merritt's surmise was correct. After looking over an outline of the topics upon which Dr. Dahlgren was to speak, I decided that I would say something along the same line.

The subject "Darwinism" is perhaps the broadest and deepest that could be selected as a topic for discussion. It goes back to the very beginning of life on this planet and includes within its

scope every species of plant and animal that ever existed here. To attempt to more than merely touch on a very few phases of the subject in one evening would be impossible. Most of us, in the effort, would probably go floundering through the great mass of detail and lose ourselves completely. Therefore, I feel this Society is to be congratulated in selecting for the purpose Dr. Dahlgren, a conservative scientific thinker and an earnest student in biology. Dr. Dahlgren was secured just in the nick of time, for I understand he has severed his connection with the American Museum of Natural History and will leave New York next week for Chicago to continue his biological work at the Rush Medical College.

There is no topic, perhaps, of the past fifty years that has been more widely or generously discussed from a greater variety of viewpoints than "Darwinism." And no subject of such broad general interest has been less clearly understood. Laymen, theologians and that very large body of pseudo-scientists have run rampant with this subject.

"Darwinism" and "evolution" are not synonymous. The theory of descent, or origin of species by a process of evolution, is accepted by biologists as an established fact.

The homologies of structure and the embryologic development of all known organisms, both plant and animal, seem to have but one possible explanation—and that is a common ancestry.

The theory of "the survival of the fittest by means of natural selection," as advanced by Darwin, and commonly spoken of as "Darwinism," has been attacked and defended by strongly opposing forces of biologists during the past fifty years, and the battle still wages, with no signs of an acceptable conclusion being reached.

The great mass of facts collected by Darwin as evidence in support of his "natural selection theory" failed in its purpose, but it served to establish a most secure foundation for the theory of descent. Darwin devoted twenty-two years to collecting material evidence to sustain his theory before he allowed the publication of his "Origin of Species," apologizing even then for its incomplete form in the following words: "It will take me many more years to complete it, and as my health is far from strong, I have been urged to publish this abstract."

One writer has aptly said, "The greatest part of Darwin's

greatness was that he launched his theory only after making the most remarkable collection of facts ever gathered together in biological science by one man."

Within a few years after the publication of this wonderful accumulation of evidence, under the title "Origin of Species," the "theory of descent" became a generally accepted doctrine in the scientific world. It is one of a few really broad generalizations in biology that are accepted by practically all naturalists of the present day.

But the "how" and the "why" of this great theory remain still unexplained. Not one hypothesis dealing with this phase of the question has ever been generally accepted by naturalists. Therefore it would be idle for us to attempt to discuss the evidence for and against the several hypotheses that have been advanced.

The wonderful discovery of Gregor Johann Mendel; made in 1866, in relation to the inbreeding of hybrids, and which established his law of "dominance and reversion" in such breeding, marked the first step toward changing biology from a science of observation only to one of experiment also. And with experimental biology being carried on as it is by many naturalists of the present day we may hope for a more rapid increase of definite knowledge on this question than has been possible in the past.

It should be interesting to us as dentists to note what importance the study of the teeth has been in solving his problem of evolution.

The teeth, because of their hardness, are the most perfectly preserved of all fossilized forms. They present the most complete geological record obtainable, which, coupled with the fact that they are one of the most progressive tissues in the animal economy, makes them of especial value to the student in palæontology. "In the evolution of the horse no other system of organs has undergone so profound a change as that of the teeth" (Osborn).

Through the entire course of evolution the teeth seem to have been peculiarly adaptive to every new food condition that presented. In other words, the influence of function seems to have been a prime factor in the development and preservation of the dental organs of the fauna of past ages. And this rule of function seems to have been a prime factor in the development and preservation of the dental organs of the fauna of past ages.

And this rule of function seems to be still active. If civilized man could be taught to thoroughly masticate his food, and the practice continued for a few generations it would result, I believe, in such marked improvement of the dental organs that there would be small demand for the services of the dentist.

The theory that mammalian molar teeth of the present age have reached their complex form through a long series of evolutionary changes is gradually being accepted by biologists, palæontologists, anatomists, and zoologists. After many years of patient study in comparing the teeth of recent mammals, Prof. Edward D. Cope in 1885 reached the conclusion "that the tritubercular type of molar was ancestral to many, if not to all of the higher types of molar teeth. Prof. H. F. Osborn, a conservative palæontologist, considers this conclusion "one of the most important generalizations ever made in mammalian comparative anatomy." He says "it outranks in importance the proof of the pentadactyl nature of the feet of hoofed animals."

This is a wonderfully strong statement to come from such a careful student as Prof. Osborn. Yet when we consider the weight of evidence contributed by the teeth in establishing the identity of the eohippus, the common progenitor of the horse, the tapir and the rhinoceros, we can understand why he places such high estimate on this conclusion reached by Cope. He further states that the evidence in support of the conclusion of Prof. Cope "is so overwhelming that he (Osborn) no longer considers it a theory but an established fact."

Prof. Cope, after studying the mammals of the Mesozoic period, the age of reptiles, further advanced the theory that this early tritubercular form had developed from an ancestral reptilian type, or single cone, by the addition of lateral small tubercles.

To summarize, the conclusions of Prof. Cope were as follows: The present complex forms of mammalian molar teeth, including those of man, developed first from the simple reptilian cone—the teeth of one jaw alternating with those of the other; second, the development of a small tubercle on the mesial and one on the distal surface of the primitive cone; third, a shifting of these smaller tubercles to the side forming a triangle—thus reaching the tritubercular type, referred to above as the parent form of mammalian molars of the present age.

These remarks have wandered considerably from the subject

of "Darwinism," but the study of the development of the teeth has contributed so much toward the theory of descent that I felt it would not be out of place to touch upon the theory of Profs. Cope and Osborn.

Dr. Wheeler—I had the pleasure, a few evenings ago, of attending a lecture by Professor Dr. A. Penck, and he showed the photograph of the skull of a member of an ancient race, of which he estimated the age to be 200,000 years. It was very remarkable to see how well the teeth were preserved. I mention that to show how long the teeth will last, as has been said in the remarks of Dr. Kemple upon the change of the teeth of the horse. It is estimated that the horse has been three or four million years in evolving to his present condition. It is very interesting to go to the museums and note those changes. The change in teeth is very slow, and while they do adapt themselves in time, it must be so slow that if the environment goes on very rapidly, it would account for the tendency to decay in the teeth of the human race at the present time.

Dr. Leroy—I wish to pay my little tribute of thanks to Dr. Dahlgren. The subject of evolution is highly interesting and as we were to have an essay on the subject I resurrected a volume from my library in which appears a little foot-note I would like to read. It is: "The reader ought to know that the doctrine of evolution was known in India long before the Christian era—about the seventh century before Christ. Kapila, the father of Hindu evolutionists, explained this theory for the first time through logic and science."

Quoting from Sir Monier Williams: "Indeed, if I may be allowed the anachronism, the Hindus were Spinozites more than 2,000 years before Spinoza, and Darwinians many centuries before Darwin, and evolutionists many centuries before the doctrines of evolution had been accepted by the scientists of our time and before any word like evolution existed in any language of the world.

As to evolution, Science says that there are two principal factors in the process of evolution: first, the tendency to vary, and, second, the tendency of environment to influence variation, and evolution depends upon three laws: Tendency to vary, natural selection, and struggle for existence. Science tries to explain

through these three laws the physical, mental, intellectual, moral, and spiritual evolution of mankind. But the theory of evolution will remain unintelligible until Science can trace the cause of that innate "tendency to vary" which exists in every stage of all living forms. These ancient Hindu philosophers knew of the evolution theory and admitted the laws of variation and natural selection, but went beyond even modern science by explaining the cause of that "tendency to vary." They said, "There is nothing in the end which was not also in the beginning," a law which governs evolution as well as the law of causation.

"If we admit this grand truth of nature then it is not difficult to explain by the theory of evolution the gradual manifestation of the higher nature of man."

If we do not admit this "law" then the problem confronts us, "How can non-existence become existent? How can something come out of nothing?"

Quoting from another Eastern preacher, this expression struck me very forcibly: "The evolution into another specie is caused by the (in-filling) of nature." The nature is filled not from without but from within. Nothing is superadded to the individual soul from the outside. The germs are already there, have always existed, but their development depends upon their coming in contact with the necessary conditions requisite for proper manifestation.

These Oriental philosophers believed the aim and end of evolution was for perfection. Physical evolution in the human form, and as the purpose of all natural laws is directed thus, intellectual, moral, and spiritual perfection is the aim of the soul." The tendency of nature is to have perfect manifestation of her powers.

This treatise from which I quote treats of the doctrine of reincarnation—"otherwise the theory of evolution will remain imperfect, incomplete, and purposeless"—unless we accept it. The doctrine differs from the accepted theory of evolution in admitting a gradual but continuous evolution of the subtle body through many gross forms. The gross body may appear or disappear, but the subtle body continues to exist even after the dissolution of the gross body, and remanifests itself in some other form. The theory of reincarnation when properly understood is a supplement to the theory of evolution.

Dr. Dahlgren—I would say in closing, that the quotations we have listened to present an interesting case of parallelism of thought.

In regard to the point about the scientific instruments, etc., without which it is difficult to perform any kind of scientific work, I would say that in the development of the evolution theory, as the gentleman has pointed out, it was to a very large extent the philosophers, rather than the scientists, and it is only by the combination of the philosopher and the scientist in Darwin that the modern formulation of this ancient evolution theory became possible.

Adjourned.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A regular meeting of the Institute was held Tuesday evening, March 2d, 1909, at the Academy of Medicine, New York City.

The President, Dr. Charles O. Kimball, occupied the chair.

The minutes of the last meeting were read and approved.

COMMUNICATIONS ON THEORY AND PRACTICE.

Dr. S. E. Davenport—About four years ago, I read a short paper before this Society, in which I advocated the making of impression cups for individual cases, those cups to be used with composition instead of plaster. I also advocated at that time, the use of composition in place of plaster in occasional cases where certain conditions of the mouth existed. During the time which has passed, I have given more attention to this question, and I now wish to make a further statement on the subject, having changed my mind—simply in degree. This evening I would like to state that, in my opinion, modelling compound should be used in a large majority of cases where artificial dentures are to be made, in combination, usually, with a cup made specially for each case.

Composition used in a cup which fits the mouth accurately gives a more dependable impression of most mouths than does plaster, as composition reproduces the condition existing in the mouth when the plate is in position and is being pressed upon by

the occluding teeth. In other words, plaster is too soft and gives an impression of the mouth with the soft parts hanging, as it were. The softer the mouth, the less valuable is plaster of Paris for an impression material. Plaster takes an impression with the soft parts in a quiescent state; the composition, properly used, takes an impression which duplicates the condition existing when the plate is in position, the material possessing sufficient firmness of substance to press the soft parts out of the way just as the plate will.

It has been said that men, when they pass the years of youth, adopt many methods because they are easy. If any of my hearers thinks this is one of those methods he is in error, because it does not economize time, and it is not easier; therefore I do not advise elderly men—if there are any present—to use this method.

A brief description of the plan: An ordinary cup fitting the mouth as well as possible—is used and a composition impression is taken, from which an ordinary, rough, plaster model is made. Upon that model is formed a special cup. Either one is swaged, the teeth first being cut off, or one is cast of pure tin, in which case the teeth are not cut off. The cup is fitted to the mouth and trimmed about the teeth, if there are any so it will not bind against the teeth or hurt the soft part. The composition is then heated, a very thin film placed upon the cup which has been warmed, and the material carried to place with considerable and evenly distributed force, so all parts of the mouth will get the same attention. The thinner the composition the sharper the impression and there will be almost no drawing, even in partial cases. The pressure being great, and the cup following under very thin composition, the soft parts are pushed away, and conditions similar to those existing when a plate is in position are reproduced. I happened to have a practical case in the office to-day, and thought I would bring it here with several of the specially made cups to show what could be done.

This is a gold plate for a partial case, but one for which it was not advisable to use clasps, and the suction is so great that considerable effort is needed to get it out of the mouth—a condition not easy to secure usually with partial cases. Often the impression can be improved by removing it from the mouth several times and trimming away all excess of composition. Long experience with this method has taught me that the thinner the

composition used—the cup being properly adopted to the mouth, the more accurate the impression.

There are various ways in which such impressions may be secured without making a cup for each case, but I consider the labor of making a special cup well spent insurance of accuracy.

In closing I will add that usually when making a rubber plate I vulcanize the plate and get it right before paying any attention to the teeth to be added. This is used as a base plate just as a gold plate is, having many advantages over the wax base plates generally used and where suction is desired, that can first be made sure of before adding the teeth.

The President—Those of us who have watched the course of events in our profession in other cities are aware that in the neighboring city of Boston there has been a marked growth in the proper relation between the dental profession and the community at large. There has been established there a condition which, as far as I know, is unique, and it is to hear some report of that and its significance that we are met here to-night. It is a great pleasure that we have with us to-night a gentleman who has been closely identified with the Dental Hygiene Council of Massachusetts from its very inception—Dr. William R. Woodbury—who will address us on the “Real Significance of Dental Hygiene.”

For Dr. Woodbury's paper see page 114.

DISCUSSION OF DR. WOODBURY'S PAPER.

The President—We have heard Dr. Woodbury before in our councils, and are very grateful to him for the message he has brought. Now we will hear from a gentleman whose work in this city is too well known for me to particularize it—Dr. William H. Allen—the head of the Bureau of Municipal Research.

Dr. William H. Allen—A number of fine things have come from Boston. I have a true story about Dr. Woodbury, of something that just happened at the Subway. Very anxious to get to the Grand Central Station, he asked the gateman at several stops if he was on the right train. As Dr. Woodbury started to get out, the man said, “Step lively, please,” and then realizing that he was in the presence of Boston, he said, very deliberately: “Please move with a somewhat greater celerity.” I think that

is rather a hint to us, because while we have been moving a bit toward dental attention to children, Dr. Woodbury has been moving with "a somewhat greater celerity," and has accomplished great results.

As I listened to his paper to-night, I thought how true it is of the dental profession, the one that has a halo which it was not born to, and has not achieved, but which others are actually thrusting upon it—both halo and wings! I thought as I looked around the room, how very much are we laymen willing to believe of you dentists, and how much we are prepared to expect from you. I see here the chairman of the Committee of Physical Welfare of School Children, Mr. Burlingham, who has been active in interesting a number of people in the dental care of school children. There is present also, the head of the industrial school of the Children's Aid Society, where has probably been made the most eloquent and most humane demonstration of what dental work for school children can do. Why the children at that clinic actually look forward to the opportunity there given for demonstrating ability to sit in a dental chair and smile dull care away.

We have here also Dr. Luther H. Gulick, of the National School Hygiene Association, and I hope Dr. Gulick will tell us to-night how this subject has taken hold of the country, and how it arrested the attention of the recent meeting of the National Educational Association in Chicago.

We have here Dr. Josephine Baker, head of the health department's Bureau of Child Hygiene, who has under her control the largest number of school inspectors and nurses of any single individual in civilization. The achievement of her ideal and her department's ideal for children's health depends in large measure upon the co-operation of the dental profession. There again is the halo that is passed up to you, and there too the need for the sympathetic assumption by you of this great opportunity.

Last night I attended a meeting of some dozen dentists in the city, and I said there what I felt very keenly at the time, and what has grown upon me since. I have never at any time met with a group of men where the need for what Dr. Gulick calls "team work" was so beautifully illustrated, as at this meeting of dentists plus one or two physicians, and one or two social workers. The medical men said they lamented the fact that it

had taken them all these centuries to see the need for dental work. Someone else called attention to the need for the social worker, and the school's need for the dentists' helping hand in working out the problem of school and child hygiene. They saw that each was essential to the other, and it seemed clear that there was a basis for operating the programme which Dr. Woodbury has outlined to-night.

I should like to make one or two suggestions from which it seems to me something can grow from this meeting to-night. I am sorry Mr. Brace, of the Children's Aid Society, is not here. This industrial school on West 53d Street, took hold of its dental clinic very aggressively. It has made a demonstration that is used as the basis for dental attention at Bellevue Hospital, and I think it will spread to every reputable hospital throughout New York and the entire country. In this town to-day are a number of men who see the value of the educational work that Dr. Woodbury outlined. I think just as soon as any appreciable number of dentists come out into the open and say: "We want somebody to furnish the sinews of war that will keep up this fight continuously, so that the educational programme indicated by the term "dental hygiene" shall be carried from one end of the country to the other,"—I believe the money—the relatively small amount of money needed for that educational work, will be forthcoming.

And that leads me to the second suggestion that such funds, when obtained, shall not be used for a general repair business for some three million persons; but to co-operate with the twelve or fifteen thousand teachers in the city, and with those who are doing the work for the Department of Health and the Department of Education, so that all children of New York City shall be benefited.

Last night Dr. Brannan, president of the Allied Hospitals, was present, and one or two others in touch with hospital work, while to-night this meeting seriously takes up this question of socializing the dental profession. It seems to me these two occasions are epoch-making for New York City, and for our State; indeed, for other parts of the country also; for when this great city gets to moving, it means the rest of the country sits up and take notice.

Mr. Rufus E. Miles, of the Bureau of Municipal Research—The Department of Health of this city was among the earliest of the departments of health in this country to pay systematic attention to the health of school children, and it is, perhaps, no exaggeration to say that it does that work on a larger scale than any other city in the world. There are more school children in this city than the total population of any other city in the United States except Chicago and Philadelphia. With such a field, the Bureau of Child Hygiene of the Department of Health has possibilities and responsibilities almost unlimited. Some of the figures of its work of last fall have been charted at our office. You will see at a glance that defective teeth are by all odds the most general of all the defects found. It is not for a layman to attempt to estimate the relative importance of the different physical defects; but at any rate defective teeth are more numerous than any other defect. This fact is not to be passed over lightly by saying that these are the temporary teeth, for even in the higher age periods—children of twelve and fourteen years and over—at least forty per cent. have defective teeth.

A second important fact has been made clear by a recent investigation, viz., the utter inadequacy of the facilities for treatment in this city. Of some sixty or seventy general clinics in Manhattan, only eighteen give dental treatment; of these eighteen, only six pretend to do any filling. All the rest limit themselves to extractions. In the eighteen clinics there are less than on hundred chairs, nearly all of which are available for not more than two hours in any one day, and most of them for only one hour a day.

It is clear from what Dr. Woodbury has said, that education must play an important part in the campaign for oral hygiene. The educational campaign for oral hygiene among school children is, in my opinion, squarely up to two sets of people—to the teachers who teach hygiene, and the nurses who visit the children in their homes for the purposes of instructing them in general hygiene.

The great remedial contribution to the health of the mouth can be rendered by the dental profession. If tomorrow one hundred dentists were to volunteer their services for one hour a week, they could be put to work within two weeks without having

to increase the plant of any of the present dental clinics. For if each chair is used for only an hour or two a day, that means that with very little additional equipment the service can easily be multiplied by five—provided the dentists can be secured.

That is the question we leave with the Institute—whether it will undertake to see that this dental service is furnished.

Dr. Josephine Baker, head of the Division of Child Hygiene, Department of Health:

It has sometimes seemed to me in looking over the figures of the number of dental defects that when we found a perfect mouth we could in a trite way call it an abnormality. The abnormal child is the one with a perfect set of teeth. So far as the work has been carried on, since the Spring of 1905, we have found that about 70 per cent. of the children examined have defective teeth. This has occurred not only among the temporary teeth, but also largely in the permanent teeth, as Mr. Miles has told you. In this city we examine each school child, giving a complete physical examination, and this examination includes the examination of the mouth. The work of the physicians in this regard is, of course, purely diagnostic. The actual prophylactic work is done by the nurses, and there our activities have seemed to come to a sudden halt. During 1908 the inspectors of the division of child hygiene examined about 321,000 children. Of that number, 174,000 or about 65 per cent. were found with defective teeth, and yet out of that total of 174,000 we have on record only returns from something over 1,100 children—meaning 1,100 out of that 174,000 were the only one where we had knowledge that actual treatment was being received, and in those particular instances, 854 children had defective teeth extracted, while only 358 had them filled.

This is a condition which can in no way be deemed satisfactory. Our nurses are instructing the children in what we call mouth hygiene, by personal instruction, by demonstration, by insisting that the children bring back their tooth brush and powder to have the nurse show them how to use them. We will soon have a large number of circulars recounting the dangers of a badly kept mouth and teeth, and giving simple directions as to the care of the mouth, and a prescription for a very simple tooth powder which can be put up cheaply by any druggist. These circulars will be distributed broadcast throughout the schools.

The condition is an alarming one, and as all of the speakers of the evening have said, it is up to the dental profession to meet us more than half way. The Department of Health would most gladly welcome this aid. It would co-operate with the clinics to the fullest extent, and nothing would be more valuable to the full development of that work than the co-operation of the dental profession. Up to this time we have not had it, and most of the children are unable to pay for such care. The ordinary medical clinics are quite sufficient for the correction of the other defects in children, but when it comes to defective teeth, it is either a question of the parent paying a dentist's bill, or allowing the child to go without care, and in the majority of instances the parents are unable to pay.

The question of defective teeth has a very vital bearing on the general health of the child. I have not the exact figures with me, but in the majority of instances defective teeth are associated with other physical defects. The occurrence of enlarged glands is very common. Malnutrition is also a common accompaniment, and I think it would be hard to find a child suffering from malnutrition without finding defective teeth. As the essayist has told you, we must start at mouth hygiene if we would accomplish very much. Often the children cannot be treated unless their mouths have proper attention first.

I wish to emphasize the fact that we need you, and need you seriously, and hope you will rise to the occasion and open some clinics, so we can see that these children receive the treatment they require.

Dr. Luther H. Gulick—At the meeting of the Department of Superintendence of the National Education Association, held in Chicago last February, a physician reported that he had taken a number of high school boys, and after examining their mouths, had stood them up in the order of excellence of teeth. He then had the boys run around the gymnasium track a dozen times, and compared their heart rates with the heart rates before running. He found that while there were some exceptions, the boys with the poorest teeth had the greatest acceleration of cardiac rapidity. The reason for this was probably that those with the poorest teeth had the least efficient nutrition and hence muscular systems, which showed particularly in the power of the heart to

respond easily to extra work. The weaker the heart, the more rapidly it beats when additional work is placed upon it.

The mouth is not merely the vestibule of the stomach, but because of its intimate relation to the entire digestive tract, its condition is an index of the way in which the whole individual is nourished. Defective and decayed teeth are not merely significant because of their own condition, but because of what they indicate as to the processes in the whole digestive apparatus.

The most profound work in medical science is not the cure, or even the prevention of disease, but the cultivation of those powers of the body which will not only enable the individual to rise superior to the invasions of disease, but which enable him to live vividly and powerfully.

My father was a medical missionary in the Micronesian Islands. He told me of an attack of measles there among the natives, who had never before had the disease. It took off more than half of the individuals of that section. The reason was that those natives had a low degree of vitality for resisting the disease. We, on the other hand, have developed a high degree of immunity to measles. It is necessary to develop a high degree of ability to digest food; there can be no such thing as immunity from hunger.

Of what use is it to teach children the multiplication table, to teach them reading, history, or anything else, or to give them exercises for straightening the back, when the cells of the body are not being adequately nourished? I am not one who believes that malnutrition in the large majority of cases in our American cities is due to deficient quantity of food. It is due mainly to the eating of the wrong food, or the wrong eating of food. In either case, the remedy rests with the dentist and with the physician. In New York, as in Boston, the initiative must be taken by the dentist.

However, the problem cannot be met by the dentist or by the physician alone. I have been fascinated by the clippings that have come to my office from day to day about the council recently held in Boston. Comment has been made by all the newspapers in the country. No matter how efficient may be the Bureau of Child Hygiene under Dr. Baker and her assistants, the necessary thing to do is to get into the minds of the teachers in the schools of New York City the fundamental facts of dental hygiene; and

it can be done through publicity. School people, and the public generally, can be educated through the press.

There is great interest everywhere in these matters of hygiene, as is shown by the numerous articles appearing in the daily and monthly press. The time for the discussion of these topics is ripe, and I agree with Dr. Allen that the fundamental need in meeting the problems at present is not money. I am convinced that it is not very difficult to procure the necessary funds; people are willing to give if we can show them the need. What we need particularly now is adequate leadership, of just the kind that it seems to me this meeting indicates.

Mr. Wallace Gillpatrick—of the Chrystie Street House:—

I am not prepared to give advice as to the propagation of this splendid campaign, but as a social worker, I can give testimony as to the great need. I am interested in boys and young men between sixteen and thirty years old, who for some reason have become homeless and destitute, and have reached the point where, if they are not helped, they will perish. If we meet a boy who has not slept in a bed for several nights, has had nothing to eat, and does not know where to get it, we need to do certain other things for him before we consider the teeth. But I have been appalled to find what bad teeth many boys have.

I will not mention the clinics by name, to which I have directed some of these fellows, and where they have received such unsatisfactory attention. Some of the clinics are only open certain nights, and when a fellow has a terrible tooth-ache, it must be attended to on the night when he has it.

When a foreigner goes, not speaking English perhaps, with a tooth that is well worth attention, and that tooth is extracted, it seems the proper interest is not being manifested. One of the avenues that is open to these young men who are strong bodily, but have no trade or calling, is the army. I have seen many fellows eager to go into the army, who were rejected on account of defective teeth.

One fellow in whom I have been very much interested, a foreigner, and entirely alone here—was sent to the New York State Reformatory at Elmira. After he had been there a few weeks, he was permitted to correspond with me, as he had no one else. He wrote to me to send him a little money that he had

saved and left in my care, so he might have his teeth attended to. I think it was about \$7 which I sent to him, and he had his teeth repaired.

I presume you gentlemen are sufficiently familiar with present conditions to know what happens to the teeth of prisoners if they have no one to give them money, or do anything for them. I fear that some of those prisoners suffer for years, the agonies of tooth-ache before they are liberated and can have their teeth attended to.

I do not quite agree with the suggestion that all our efforts should be expended on prevention. I realize the great need of more preventive work; but I am interested in remedial work, in relieving the needs of young fellows who have as good a right to life and the enjoyment of life as we have; and if one of these young men gets nothing out of life, if his life is entirely barren and destitute of good, a hundred other successful lives will not compensate him for what he has lost. I hope I shall be able to call on many of you gentlemen to aid me in getting the boys' teeth in order, so they may be more fit.

Dr. John O. McCall—I am very glad to have an opportunity to speak on the subject of the Elmira Reformatory, as I happen to be well equipped with information in regard to the conditions there. Dental work there is done by a member of the Sixth District Society, of which I am a member. He goes to the institution one morning a week, and is paid by the State, a very small sum to extract teeth. Any work that is done beyond extracting, such as filling, must be paid for by the inmate, from money sent to him from outside. About 50 per cent. of the inmates write for money for that purpose, and about half of that number receive the money. About 25 per cent. therefore are able to have work done, beyond extracting.

Dr. Mitchell sees only the men who request his services, and therefore he sees very few of the men in the institution, yet he is kept very busy attending to those men. The conditions in that reformatory, and we have reason to suspect, in every charitable institution and reformatory in New York, are deplorable. We cannot get statistics, because not all the men come to Dr. Mitchell, as I said. He sees only those who request his services.

The conditions are recognized by the medical men there, as is shown by the fact that the head physician would be very glad

if he could have two dentists every day in the week, all day long, to attend to the teeth of these men. That will give some idea of the state of affairs in the reformatories, and I am very glad to be able to say that a movement was set on foot by our society, to secure some relief for those conditions. The way to that relief is very devious, and we will not be able to do anything in a hurry. It will be a long time, because we cannot go to the Board of Managers of the institution, inasmuch as they will say we want more money for ourselves. They will not see the altruistic side of it, and we can only get it, I think, by pressure of public opinion, when that is stirred up for the relief of the inmates of these institutions.

Mr. Charles C. Burlingham—My mind has been full of questions as I sat here and listened. The Physical Welfare Committee, of which I am chairman, has made a valuable contribution to this cause; it is responsible for Dr. Wheeler, who is a member, and it is responsible for Mr. Brace, who is a member. I have not learend all I hoped to by coming here. I have not learned what the council in Massachusetts does, nor whether there is a council here, and what it is doing. I believe that I know, in a theoretical way perhaps, the importance of taking care of the teeth of school children, but I am almost alone in that enlightenment. You gentlemen all appreciate it, but the public here in New York knows nothing about it.

Take the Board of Education of this city, who certainly ought to be interested, with 600,000 children or more. Here are 174,000 children, as Dr. Baker told you, with defects of the teeth, and apparently only 1,100 paid any attention when notified. Does the Board of Education appreciate that fact? Not at all. Does Mr. William Rhinelander Stewart, the head of the State Charities appreciate it? Not at all. He is one of the most active of men, physically and mentally, and if he appreciated the fact that dentists were needed in reformatories it would be done, not by any devious methods as has been suggested, but at once, because he is a forcible man. What a lamentable picture that was of the Elmira Reformatory! My mind ran down to the boys of younger age in the different institutions—in the Catholic Protectory for instance. What possible hope can there be of remedying conditions in this State, unless the men in charge of these institutions know about it, not theoretically as I do, by

accepting on account of my deference for you your statements, but through practical, every-day knowledge of these dreadful conditions which result in tuberculosis and everything else.

One thing has not been said this evening, and it struck me over and over again as a partial excuse for the failure of the dentists to grasp this halo and pin it on—if halos are pinned on—I do not know much about them! Dentists are paid like bricklayers, by the hour—and every hour they give up is a real sacrifice. If I, as a lawyer, give, or waste, my time for charity, I can make it up in the evening, or some other time; but when the sun sets, your work stops.

If there are one hundred chairs, and eighteen clinics, and so many dentists in this city—I find about twenty in one block where my dentist lives—I think there should be more volunteers for dental service.

What does the Board of Health inspect the children for? To demonstrate the need for it? They have shown that until I am perfectly exhausted by it, and they have nothing to do but to examine them again and again. Dr. Baker and her corps of assistants have examined 375,000 this year, and she is ashamed that a million were not examined. What good does it do? It does good, if it is followed up, of course. If some of the gentlemen in this room, and I suppose all of them are interested—my dentist among them—were willing to give up a little time, much could be accomplished.

I have had a lot of office boys. They come and go, their teeth are always troubling them, and I never know what to do about it.

The Children's Aid Society is a great success as a demonstration; but if you gentlemen want to affect public opinion, and remedy this disgraceful condition which you pointed out, and save us all from cancer and tuberculosis, the thing to do is to get busy now yourselves, and not wait for the Children's Aid Society to make another demonstration. When those hundred chairs are filled, when we see that these gentlemen have given of their time, which is really money, for public service, and have made that sacrifice, we can go to the Mayor and the Board of Estimate and Apportionment and say: "You must hire these men and pay them," and we can go to Mr. Stewart and these other people, with confidence and assurance. If I were asked to go

now and make the request, I should be ashamed to do so, and I do not think you, as dentists, have any right to ask, because you have not done your own part toward it.

Dr. Arthur H. Merritt—In the discussion which has followed the reading of the paper, we have heard a good deal about the short comings of the dental profession.

We have heard from the physician, the lawyer, and the social worker, and it might not be inappropriate at this time to hear from the dentist.

For one, I am not going to apologize for him. He has his short comings. Who has not? The problem of dental dispensaries is a new one to the profession, and I know full well the indifference which has prevailed in this matter.

Personal experience with public dispensaries has shown that most dentists regard the fact that they are busy as sufficient reason for refusing to serve in this way.

There is, however, something to be said from the dentist's standpoint. The physician may give an hour or two each afternoon to such work, and not materially interfere with his private practice, and, moreover, gain a valuable clinical experience. Every hour given by the dentist, means one hour subtracted from his earning capacity.

The routine duties of a public dental dispensary affords little clinical experience of interest or value. The work is necessarily slow, and comparatively few patients can be served in an afternoon, as the complete lack of dental care in such cases, brings to the dispensaries, patients whose mouths are in a deplorable condition, requiring an infinite amount of time and patience to bring about a condition in any way approaching normality.

The dental dispensary of the Children's Aid Society, of which we have heard so much this evening, has been open since October 1st,—87 days, not for one hour or two hours, but for an entire afternoon each day. There has always been one dentist in attendance and often two and three, and yet during those 87 days there has been but 55 cases dismissed as finished. Double that number of patients could have been operated upon for appendicitis in half the time, and the operating surgeon got a lot more fun out of it, and been credited with being a great surgeon and philanthropist.

It must be evident therefore that to care for the six hundred thousand school children of this city, the services of the forty thousand dentists of the United States would hardly suffice to meet their need.

There is certainly a great need for dental service among these children. My own experience has shown that the number suffering from defective teeth, to say nothing of other oral diseases, exceeds 95 per cent. in children between the ages of 5 and 15. Above this age the per cent. increases.

The so called dental dispensary which limits itself to the extraction of teeth is a public nuisance, in that it does more harm than good. The purpose of a properly conducted dispensary is to save the teeth of its patrons. To do less than this is not dentistry—it is the grossest mal-practice. I firmly believe that dentists are coming to see more and more clearly the great responsibility which rests upon them in this need, and at no distant day they will most willingly take up a duty which only they can perform.

Dr. A. Ernest Gallant—I cannot come before you as the president of any society, or as a settlement worker, but I heartily agree with those who advocate the teachings mentioned. I believe children should be sent to the doctor not only once a year, but as often as may be necessary, to see what should be done. The 175,000 children with defective teeth already examined, is a tremendous number. It means roughly that each dentist in this city—of which there are 2,000—would have 9,000 patients a year. That seems a rather formidable task—although I do not know how many patients a dentist could attend to.

We in the medical profession have allowed a system which is absolutely wrong in detail, of free dispensary attention by physicians. I believe in charity. I have to do a lot of it, but for men to give up their time and be practically the only class of men that do it, is not the way to remedy this defect. If the inspectors of the Board of Health are paid to find defects, so should the man who does the work which remedies these defects.

I hope dentists will form an organization for looking into this question of the school children's teeth, one that will make itself felt even in Albany. My advice is do not allow yourselves to be drawn into any scheme unless you are paid for your work, because if you once get that kind of thing on your backs, never

in the history the world will you be free from it. There is no more reason why the city should expect a professional man to work without remuneration than to ask a mason to build a wall without paying his daily wage. The men who are working in clinics and dispensaries, half-starved some of them, should be paid for their work as well as anyone else. If we professional men, as a matter of variety, wish to go into some sort of charity, and do something for our fellow-men, we make a recreation of something that is a pleasure to us; but this making it compulsory is not right. It may be Christianity, but the way it is done, and the people who demand it, certainly do not do it from a Christian standpoint.

The last speaker I believe has made the most sensible remark in reference to the work, and as a dentist he realizes just what it means.

Dr. Hoag—I find, going to the clinic as I have done once or twice a month, that each time I see an entirely different set of children, and have to do work that someone else has started. About half the time is wasted finding out what the other man did, and perhaps his method is entirely different from mine. Personally I would much rather give twice the time in my own office to the same children, and follow the cases from start to finish. I do not wish to discourage anyone, but we should see this thing from all sides, and perhaps we are going at this from the wrong end. The men who are in charge of the clinics are doing magnificent work, and I would not criticise them; but they have not the material to do the work with.

Dr. Wheeler—I want to appeal for the need of one man especially. The Sea Breeze Hospital that is carried on by the Association for Improving the Condition of the Poor, has had a dentist who has served for some time, and he cannot serve longer.

Dr. Hoag says he would rather have the children sent to his office. I am sorry we cannot send them from the Sea Breeze Hospital. Personally, I would not want them running into my office. The chance for contagion from various diseases is large, and for many reasons I would rather give my time and go to the clinic.

The Fordham Hospital, the Harlem Hospital and the Gouv-erneur Hospital are ready now for dental services. They will

equip dental departments the instant they can find men to do the work. The Children's Aid Society will equip in their schools, as many chairs as they can find dentists to operate. This work, compared to the needs, is all like a grain of sand on the ocean beach; but it amounts to a lot for the people who receive it, and it has great influence in an educational way. There is one thing sure, I think a dentist should be willing to sacrifice some of his time, as the physicians do.

I was surprised to hear the remarks of Dr. Gallant. I do not believe his sentiments are held by one-tenth of one per cent. of the medical profession. I know the medical profession fairly well, and I believe they would repudiate them. They have given their services not because they wanted to do charity, but because they know there are thousands of people that would die miserable deaths unless there is an opportunity for them to be treated at less than the customary fee, or for nothing. That is what this enormous system of hospitals all over the country is established for.

The medical profession, which I believe is the most altruistic, has come forward nobly to do that work, and while the system has been abused some people driving to the free clinics in their private carriages, the number of those cases in comparison with the amount of good done is so small as to be hardly worth considering.

The amount of good we dentists will do at first in these clinics is small, but it will not only have its educational effect on the public—it will have its effect on the dental profession to stimulate them to find some way to prevent this tremendous necessity for the repair of the human teeth. We are kindergartners yet; but I believe in time to come, we will secure better condition than now obtains, and this is only one method to stimulate the dentist to this effort.

Dr. Gallant—I would like to refer Dr. Wheeler to the articles in the medical journals on the abuse of the dispensaries. He will find there expressed the actual feeling of the medical profession on the subject. One society made up of about 700 members, was gotten together simply to expose the abuses that exist in dispensary practice.

Dr. Woodbury—One thing has delighted me. I have cried in the wilderness, but there are other criers; and New York is

quite as much a wilderness as Boston. This agitation helps; it looks toward some achievement. Talking does not do much; work is needed, and the trend of what has been said tonight will help the work. Even if it is in a small way, it is doing something. Nothing is accomplished until the matter is presented; and by hearing this matter from all sides, the dentist, the lay worker and the medical man, light is thrown on the situation, and we all get nearer to accomplishing some good. I believe this is the missing link in the broad movement in hygiene that is being carried on all over the country. This rounds the circle.

Dr. Merritt moved a vote of thanks to the essayist, and to those who honored the Institute by taking part in the discussion. The motion was carried unanimously.

Adjourned.

INSTITUTE DINNER TO DR. LOUIS JACK.

A dinner was given in honor of Dr. Louis Jack by his fellow-members of The New York Institute of Stomatology, Saturday evening, April 3rd, 1909, at the University Club, New York City. Dr. C. O. Kimball presided.

A number of communications were read conveying greetings to Dr. Jack from guests and members, who were unable to be present.

As Dr. Jack has retired from active practice the occasion was utilized by the speakers of the evening to express their appreciation of his valuable services to his profession, their acknowledgements for numerous methods and instruments devised and their admiration for his untiring efforts in behalf of Independent Journalism.

The speakers were Drs. E. A. Bogue, Safford G. Perry, J. Morgan Howe and George S. Allan.

Dr. Jack then made the following address:

Mr. Chairman, members of the Institute, and guests of the evening—You do me a great honor by presenting me with the favor you have shown, by calling yourselves together to feast one, who is not on familiar terms with your majority. You have thus conferred upon me the privilege of being put on close relation with you. Whilst appreciating your kindness and the distinction, I have some difficulty in seeing the entire fitness of so much favor.

As my life has been spent in a quiet manner in the simple performance of the duties which each day presented, there arises a feeling of unworthiness of the evident honor conferred. It probably often happens, however, that the secondary effects upon others of a faithful life makes a broader influence than the subject himself can measure.

I have come close to this association, because of my relation with Independent Journalism, which has been a paramount motive of this Institute. It has, therefore, pleased several of this audience to speak in the most commendatory terms concerning this relation and of the work in the interest of our profession carried on with the "International Dental Journal." Here the praise is beyond the desert of any individual connected with that effort to establish if possible, and maintain, what was, and is extremely desirable. The credit, the honor, for whatever was done concerning the "International" should be divided between all who were connected with this work. Justice requires me more particularly to call attention to the unselfish and constantly sustained labors of Dr. Truman. Too much cannot be said concerning his faithful daily performance for years, with every inadequate compensation. I also believe his hand and mind would have kept on without reward other than the consciousness of duty well done. With him should be joined Dr. A. J. Woodward, whose judicious counsel was of great value. We should also remember the valuable business services of the Lippincotts' and maintain admiration for the typographical character of their work.

The effort to establish the "International" was from the first to the end, a constant struggle in the face of apathy of the mass in whose interests we were working. In spite of this, and the opposition of trade interests, the effort was persisted in until the obstacles were apparently largely overcome, when one by one, in quick succession, the so-called trade journals reduced their subscription price to a point far below the cost of production. This was beyond our discretion to follow. From that moment the life of our Journal was doomed. I have thought it well to state here this cursory history of the life of the "International."

Concerning the "International," those who have preserved it in bound form, must highly appreciate the amount of useful matter published therein during the years it was conducted. So, we have to say of the "International," rest in peace, and let us

hope the effort was not in vain, and that out of the spirit cultivated, the patience shown in the face of antagonism and adversity, the outlook for the future in the same direction, may be developed a widely accepted mouthpiece for the honor and self-respect of our profession.

Dr. Allan has expressed the desire that I should make some reminiscent remarks upon my experience, and also concerning the influence of the prominent members of our calling with whom I have been on intimate terms.

In my nineteenth year I came to Philadelphia, where I had been born, from an unimportant town near Pittsburg, for the purpose of feeling the pulsative life of a prominent city, with the hope of some better future opening for me. In a few months, becoming disposed to study dentistry, I returned home and secured the consent of my mother and guardian to pursue this course, with less than four hundred dollars in my possession. I came back and engaged as a student of dentistry with the promise that three months' instruction would be sufficient to qualify for practice. Soon I became convinced that three years would be more reasonable. So with Harris' Principles and Practice, translations of the various French works and attendance upon a course of lectures upon general surgery, I was put on the way to learn some general principles.

From published addresses of Dr. Amos Westcott, Chapin Harris and others, a definite degree of professional feeling and ethical grounding was inculcated.

With money used up, I engaged as a laboratory assistant, to keep the wolf from the door, having become quite proficient for one so young in prosthetic work. In the interim I had gone through the whole round of mechanical work, including preparing the ceramic materials, and the carving of so-called "block-work."

I was also at this period making preparations to enter the Philadelphia College of Dental Surgery, which opened its initial course in 1852, of which I was the first matriculate. Here my bent soon tended towards operative procedures which I pursued with great interest, and which was sustained to the end of my career with almost absolute exclusion of prosthetic matters.

Notwithstanding this interest, I have never felt that I had reached the highest degree of efficiency, or have attained the ex-

cellence some others have reached. Still, this department became the almost single interest of my life.

The inspiration in this direction was developed by the teachings of Dr. Eliona Townsend, and observations at his clinics. He was a very graceful personage and yielded his instruments with the greatest deftness. He furthermore exercised upon the students of the college a wonderfully beneficial influence towards the cultivation of skill, as well as upon their moral tone.

The other important members of the faculty were Dr. Buckingham, noted for his rugged common sense, and Dr. Robert Arthur, known to you all in a general way, but not really appreciated as to the excellence of his character and attainments by any except those who had been intimate with him, and I might say only fully by those who had the fortune to enjoy his interesting lectures, which were logically constructed, dressed in good language and impressive by substantial personal influence. They always were written.

He was the very soul of honor, a person without fear or reproach, who carried his heart in his face. So sensitive was he upon the least appearance of departure from ethical standards that he was unsparing in denunciation, when it was proper to make expression of his views. The consequence of this fearlessness was that while loved by his friends, he was disliked by those whose standards were on a lower plane. Dr. Arthur lived, worked and died so long since that the remembrance of his work and influence has become dimmed. The profession only know of him concerning the benefit he conferred upon all of us by his demonstration of the cohesive properties of gold, and the means to develop it. In respect of this it must be conceded he led to the revolution of all operative procedures.

I have probably wearied you with what I have said, and I would fain turn to a subject that should interest all of us—the economic side of dental practice. There is either something wrong with us or the public that this specialty does not yield the reward which one so important should enjoy. Recently I had the satisfaction to prepare a paper on that subject, which in my own society excited considerable interest. The fact that even highly qualified men, in active practice, go down the end of their days in a state of comparative poverty, is one which should excite our attention. This is not the time or the place to discuss such a

matter. I cannot refrain, however, from stating that the proper course is to rise above the commercial aspect with reference to our services, and place them upon the value of the benefit to the person who becomes the subject of them.

This matter is one entitled to the fullest consideration by discussion and mutual support.

Thanking you for your kind consideration, let me express the hope that The New York Institute of Stomatology will increase in influence, and the promotion of the advancement of all that tends to the development of a high grade of professional spirit.

In conclusion the toastmaster called upon Dr. S. E. Davenport, who presented a souvenir of the occasion to the guest of the evening.

The evening was a most enjoyable one and will be remembered with great pleasure by those present.

HARVARD ODONTOLOGICAL SOCIETY.

Preamble and Resolutions relative to Henry Lauriston Upham, deceased.

Henry Lauriston Upham was born in Phillipston, Mass., February 25, 1848, and died in Boston, Mass., February 26, 1909.

He was the son of Joseph E. and Susan P. (Newton) Upham.

His early education was obtained in his native town, graduating from the Templeton (Mass.) High School later, after which, for a short period, he attended the New Ipswich Academy, at Ipswich Mass., and later the Woodstock Academy at Woodstock, Vt.; afterwards taught school in that vicinity. His intention was to have paid his way through college.

In early life he suffered from typhoid and rheumatic fevers, going for a time to Dr. Jackson's Sanatarium at Dansville, N. Y. There he improved in health; afterwards he went to Hot Springs, Arkansas.

During a business career in Tiffin, Ohio, he was a member of the Tiffin Water Board. Later he concluded to enter the Harvard Medical School in 1883, partially with a view of becoming a physician, in order to study his own condition and benefit thereby. After passing all the examinations at the close of the first year,

owing to financial reverses, he concluded to change to the Dental School, graduating in the class of 1886, of which he was secretary.

For eleven years (1891-1902) he was Instructor in Operative Dentistry, Harvard University. He was an active member of the Harvard Odontological Society from 1887 to his death.

The Anniversary Orator in 1891 and its Editor from 1889 to 1899.

A member of the Harvard Dental Association from June, 1886, to his death.

Secretary for three years, 1892-1895.

Was a member of the Mass. Dental Society, 1894-1901.

Councillor to the Mass. Dental Society, 1895-1899.

Editor of the Mass. Dental Society, 1898-1899.

Dr. Upham was an honored member of the profession, an able practitioner, writer, thinker and teacher, universally loved and respected by his clientele and confreres for his high ethical standing and his scholarly attainments.

Few men in our profession are so greatly loved and respected by those who were so fortunate to intimately know him, and no one in the community in which he lived will be more greatly missed or more sincerely mourned. His was a great nature, and his sympathetic hand and heart were felt where sympathy was needed.

Resolved, That in his decease we have suffered the loss of a member, who had an active interest in this Society, and the welfare of the profession at heart.

Resolved, That we, the members of the Harvard Odontological Society, express to the members of his bereaved family, our sympathy and sorrow in their affliction and assure them of our admiration for his high personal and professional qualities.

Resolved, That these Resolutions be spread upon the records of this Society, a copy be sent to the family of our departed member, and copies be sent to the dental journals for publication.

WALDO E. BOARDMAN,
JULIUS G. W. WERNER,
LYMAN F. BIGELOW,

Committee.

THE JOURNAL

OF

THE ALLIED SOCIETIES

VOL. IV.

SEPTEMBER, 1909.

No. 3

NIHIL SINE LABOR.

In this issue the Massachusetts Dental Society joins the Allied Societies in the publication of the Journal. This step is significant of the hearty allegiance of the organized dental profession of Massachusetts to the principle of independent dental journalism, and is an expression of the hope that this undertaking may develop into a National Dental Journal, supported by the entire membership of organized dentistry in the United States.

To me, the Editor of the Massachusetts Dental Society, comes the responsibility and the opportunity of serving the Society in carrying on this work. It is new, and enthusiasm cannot wholly take the place of experience. I trust the offerings will be accepted in the spirit in which they are given, the desire to contribute in some measure to the fund of knowledge and inspiration so generously given by the workers in many fields.

I believe a profession should support its own scientific, professional and educational undertakings, simply and solely because self-development can come only through self-exercise. In the presence of our own failure and indifference, the immense importance of materials, apparatus and machinery has made it profitable, because of the large selling power of the advertising,

for the various supply houses to carry on the work of publishing dental journals. They have succeeded simply because they made a wide appeal to the dental profession. We owe much to their success, for the recording of dental literature up to the present time is, to a considerable extent, their work, and the rapid advancement of dentistry would have been impossible without them.

The research men, the clinicians, the dental school men, the private practitioners, the dental societies and their executives have furnished the material for this progress, and this statement is none the less true because many of our brightest men, scientific investigators and experienced executives have added to these roles those of editors in existing fields of journalism. The dental profession has lagged behind in the systematic publication of this matter in its own journals. Newspaper, magazine and book publicity has been the tremendous factor of modern life which multiplies in a thousand ways the efforts of the individual. The most untrammelled publicity of widest extent is needed that dentistry may achieve a widening usefulness.

This transition stage of supply house journals will continue just as long as the dental profession fails to rise to its opportunities for development. An independent dental journal published by the dental profession has several inherent advantages. It is free to publish any matter or editorials which serve the interests of its owners, the dental profession, hence may be useful to its subscribers, in the publication of analyses of materials and drugs, in the discussion of illegitimate advertising schemes, comparisons of methods and apparatus of the various manufacturers, the support of experimental research, the condemnation of practices injurious to the profession or to humanity, the refusal to support secret nostrums by advertising them, the investigation of business methods best for the dentist, the discussion of obsolete requirements in our schools, and of patents smothered in factories, because it is easier to continue production with the old mechanisms than to make new—all these to be considered from the

standpoint of modern economics and of common sense. To advertisers the journal owned by dentists offers equal opportunities to all and special favors to none. For permanent success it must attract a large subscription list by intrinsic worth, advertisers by value for money, and adopt the business methods proved best by successful journals. Only by being most useful will the independent dental journal survive in the field of free competition.

Now, on the other hand, the supply house journals of dentistry have the tremendous economic advantage of corporation ownership. It may be pointed out here that the profession of dentistry has the primitive organization of individual units, independent, self-sufficient, and loosely organized, if at all, in trade guilds or dental societies, once found in most businesses. Business has developed from partnership to company, to combination, to corporation, with vast increase in efficiency and vast savings of waste incident to the previous forms. Now we are not here to say that dentistry ought to be all business or all altruism. Personally we believe that the combination of ethics with economics will produce the largest stock of goods, i. e., prevention of disease, restoration of comfort, function, sanitation, and appearance, for the consumers, our patients, and the greatest return to us in satisfaction and profits. We are not here to prophesy the path of dental development. But we will state that in competition the corporation has the advantage over the more loosely organized forms of industry. The larger capital, the experienced executives, the continuing policy, not dependent upon any one life, free from personal whim, fatigue, friendship or hate, with the mobility of continuing youth, without its inexperience, make the advantage apparent.

I have briefly stated why I believe we ought to publish our dental journals, and why it is hard to do so. I believe we must develop men consecrated to the work of reporting, editing and business management. The success of other journals offers food, not for vain recrimination or sentimental opposition, but for study

how to make this publication successful, yet without sacrificing our ideals of independence and self-support.

Let us, the organized dental profession, hereby resolve that we will do all possible to make this a good journal. The papers should be high grade, well arranged, incisive. Copies should be sent in advance to those appointed to discuss them; this will make the discussions better. Each clinician should hand to the chairman of the clinic committee short, accurate reports for publication. The various committees are requested to send reports of matters of interest, whether in State or local societies. Readers will confer a favor by mentioning this magazine to advertisers, actual or prospective. The editor will appreciate constructive criticism, reports of analyses, public dental hospitals, school examinations or matters of general interest to our readers. Let us make this year's issue of our Proceedings the best possible.

C. EDSON ABBOTT.

STATEMENT

ABOUT

THE JOURNAL OF THE ALLIED SOCIETIES

The Journal of the Allied Societies is an independent dental journal, published in the interests of the whole profession by these societies:

The New York Institute of Stomatology,
The American Academy of Dental Science,
The Harvard Odontological Society,
The Metropolitan District of The Massachusetts Dental Society,

The Boston and Tufts Dental Alumni Association and the Massachusetts Dental Society,
under the following conditions:

A. EDITORIAL—The Journal has no Editor; each society edits and is responsible for the matter it publishes.

B. SUBSCRIPTION AND MAIL—Under the conditions imposed by the Post Office Department, the constitution and by-laws of each society in the alliance must contain the following article or its equivalent:

“The subscription price shall be one dollar per year, which sum shall be set aside from the dues of each member of this society, and each member of the society shall, by virtue of this payment of his annual dues, become a subscriber to the publication.”

C. FINANCIAL—The cost of the cover, leading article, postage, etc., of each number of the Journal, is divided among the societies in proportion to their membership; besides this each society pays the actual cost of the pages it occupies.

D. ADVERTISING—The rules governing the admission of advertisements are those required by the Journal of The American Medical Association, and are as follows:

“No article shall be admitted unless it active medicinal ingredients and the amounts of such ingredients in a given quantity of the article be furnished for publication.

“The general composition of the vehicle, its alcoholic percentages, if any, and the identity of other preservatives, if present, must be furnished.”

The receipts from advertisements are divided among the societies in proportion to their membership.

E. SUBSCRIPTION—The subscription price of the Journal to those who are not members of any of the Allied Societies is \$1.00 per annum.

The Journal is at present a Quarterly, but with the accession of other societies, and consequent increase of material, it will probably be necessary to publish more frequently and employ a paid editor. It is expected that the increasing returns from advertising will justify these expenditures as they become necessary.

The present alliance will be glad to add to its membership such societies as are willing to accept these conditions and to join with it.

SYPHILIS OF THE MOUTH.*

BY LUTHER G. PAUL, M. D., BOSTON, MASS.

Syphilis is an inoculable disease, transmissible by heredity. The first lesion of the acquired form is a chancre; this is followed by general lymphatic enlargement by eruptions of the skin, usually superficial and symmetrical and associated with similar lesions of the mucous membrane; later by chronic inflammation and infiltration of the cellulose-vascular tissues, the bones and periosteum, and finally by the formation of small tumors called gummata, which may appear in any portion of the body, but which commonly develop in the connective tissue.

ETIOLOGY.

Syphilis is almost certainly due to the presence in the system of a specific microbe. A number of bacteriologists have announced the discovery of this organism, the *spirochaete-pallida*, but absolute proof that this special organism is the cause of syphilis has not been conclusively shown. The clinical evidence as to the microbic nature of the disease is practically conclusive.

THE CONTAGION OF SYPHILIS.

The blood of a syphilitic during the secondary period, and the secretion from a chancre, or from any of the secondary lesions, are contagious. The blood may carry contagion after all the inflammatory phenomena of syphilis have disappeared. According to Hutchinson, a recognized authority on this subject, after three years contagion is almost unknown, and there is no recorded instance of its having taken place after five years.

METHODS OF CONTAGION.

Hutchinson compares syphilis to the contagious eruptive fevers, such as smallpox and scarlet fever. Like these fevers, it is communicated from a diseased person to a healthy one, and the smallest portion of virus can affect the whole body. It has its stages of incubation, eruption and decline, and also its sequelae, the latter not always appearing, and usually being non-contagious. It can be transmitted to offspring, but its sequelae cannot be so transmitted. It differs from these fevers in the slowness of its

* Read before the Harvard Odontological Society, March 25, 1909.

course, the usually comparative mildness of its constitutional symptoms, and in requiring actual contact before it can be transmitted.

IMMEDIATE CONTAGION.

Immediate contagion, direct from one individual to another, usually takes place during coitus, though it may occur from kissing, from wounds inflicted by the teeth of syphilitics, or, in the case of medical men, from examining or operating upon syphilitic patients, when the hands of the operator are wounded or contain abrasions.

MEDIATE CONTAGION.

In this form of contagion the disease is conveyed not by direct surface contact, but by means of spoons, drinking glasses, pipes, clothing, towels, etc., upon which the specific virus is deposited by a syphilitic, and from which it is inoculated in some surface break of a person not immune to the disease. Among the frequent carriers of contagion are pipes, cigars, razors, surgical and dental instruments, handkerchiefs, articles of clothing, and, in former years, human vaccine lymph.

PERIODS OF SYPHILIS.

The primary lesion, or chancre, usually appears in from two to three weeks after inoculation. The secondary symptoms, eruption, fever, neuralgic pains, mucous patches, etc., appear in from forty to eighty days after the appearance of the chancre. The tertiary symptoms, characterized by either the formation of gummata, chronic periostitis and osteitis, skin lesions of the tuberculo-ulcerous type, and diseases of the nervous system are commonly seen in the third and fourth year after the primary lesion, but may never occur and do not usually in well-treated cases, or may not appear for many years.

The division of syphilis into periods is somewhat artificial, there being rarely any sharp limitations, one period often running insensibly into another.

PRIMARY LESION.

The primary lesion or chancre develops in from two to three weeks after inoculation. This begins as a reddened spot which in a few hours becomes papular. Many patients will say the first thing they noticed was a small pimple. This gradually ex-

tends in circumference and depth, loses its epithelial covering and in the course of a few days is surrounded by an area of induration. This represents the development of a typical chancre. Frequently, and especially on the lips, the chancre first appears as a fissure or an abrasion, or if located on mucous membrane as a superficial ulceration covered by a greyish or yellowish false membrane. At times there is no break in the continuity of the epidermis overlying a chancre, but merely a gradual thinning of this layer of the skin from the margins toward the centre; when actual ulceration exists, it forms a simple cup-shaped depression with sloping margins and smooth surface, in the centre of which is a false membrane; beneath this there is a granulating surface, which bleeds readily on mechanical interference.

The chancre is usually single. When the virus has been inoculated at the same time in several places a number of sores may appear, but they all develop at the same time, and are never due to inoculation of adjacent surfaces with the discharges of the first sore. According to Fournier, multiple chancres occur in eighteen per cent. of cases.

The most characteristic feature of the chancre is the induration. This reaches its maximum in about two weeks from the first appearance of the chancre. It has been aptly described as a button imbedded in the skin. The more vascular the tissue the more distinct is the induration.

LOCATION OF CHANCER.

The great majority of chancres are genital or perigenital. The extra genital chancre may be found on any portion of the surface of the body exposed to contact with syphilitic virus. The usual seats of such chancres are the lips, the mucous surface of the mouth and pharynx, the anal region, and the nipple. In the mouth the chancre is commonly found on the tongue, exceptionally on the tonsils or the pillars, and rarely on the gums. Among surgeons and accoucheurs extra genital sores are usually found on the fingers or hands. With very few exceptions, extra genital chancres are acquired in innocent ways. Extra genital chancres do not usually present the typical features of those on the genitalia. Chancres of the face are often much larger than the average genital chancres and sometimes form huge ulcers. This is very true of chancres of the lip.

Herpetiform erosions of the lips, papules on the tip of the tongue, scabby ulcerations of the skin, scratches which absolutely refuse to heal, chronic inflammation about the nails, resembling a paronychia, but without the usual acute inflammatory symptoms, and especially to be noted by members of your profession, a so-called "cold sore" on the lip which runs an indolent course and is very obstinate to the usual treatment, should be regarded with great suspicion. If in addition such lesions have an indurated, cartilaginous feeling base, associated with hard but painless enlargement of the nearby lymphatic glands, the diagnosis of syphilis is strongly corroborated.

CHANCER OF THE LIP.

Chancre of the lip in its beginning closely simulates ordinary non-specific sores. It often begins as a chap or fissure, frequently in the median line, or an ulceration such as would be produced by the burn of a cigar or of a cigarette. In the early stage these lesions are not characteristic, but in a few days the extension of the erosion or ulcer and the formation of a characteristic and usually very pronounced and extensive induration indicate the nature of the affection. In the course of a week or two the enlargement of the sub-mental lymphatic glands makes the diagnosis more positive. The whole lip is generally congested and swollen, sometimes reaching enormous size. Chancres of the lip have attained such sizes and degree of ulceration that they have been mistaken for malignant growths, and excised.

CHANCER OF THE TONGUE.

Chancre of the tongue is less common than that of the lips. It is usually found on the anterior part, on the dorsal surface, the sides, or the tip. It appears as a painless oval or rounded superficial lesion, with a smooth surface, frequently covered by a greyish pseudo-membrane seated upon a parchment-like induration. It often is as large as a ten-cent piece. The ulcerative form of lingual chancre exhibits a deep lesion often upward of an inch in diameter, with sloping edges, and dense well-marked induration.

The early stages of lingual chancre closely simulates non-specific lesions, hence an early diagnosis is important, since failure to recognize the condition may result in the infection of healthy persons. Any ulceration apparently caused by a carious tooth which fails to heal in a few days, after appropriate treat-

ment, should arouse suspicion, and the appearance of induration should convince one of its specific nature.

CHANCRE OF TONSILS AND FAUCES.

Chancre is rare in these regions, and when observed is so masked by accompanying inflammatory symptoms that diagnosis is often impossible. The lesion presents the appearance of a mucous patch, which is single, and if it can be palpated will be found to be indurated.

There is usually a history of prolonged sore throat and the glands at the angle of the jaw are enlarged. Primary syphilis of the tonsil is more frequent in women than men.

SECONDARY SYMPTOMS.

The period of secondary symptoms is characterized by:

1. Alterations of the blood. (Anaemia.)
2. General lymphatic enlargement.
3. Moderate fever, 100° to 101° in the evening, with malaise.
4. Muscular and articular pains, usually worse at night, of moderate severity.
5. Alopecia, involving the hairy surface of the entire body, causing ragged and irregular bald spots.
6. Eruptions of the skin and mucous membrane.

The lesions of secondary syphilis appear during the first two or three years, and are usually superficial; but cases are met with in which no secondary symptoms are observed, and tertiary lesions appear in two or three years. These cases are usually very malignant and resistant to treatment. In one case in my practice the patient was seen every few days for three months, and no rash appeared on his body, but at the end of three months numerous mucous patches appeared on the mucous membrane of his mouth. This patient was a continual source of infection, yet his conditions would never have been suspected during those three months by a dentist or even a surgeon unless they knew of his having had a primary sore.

SECONDARY ERUPTION.

The eruption of the skin commonly appears about six weeks after the chancre, but it has been seen within three weeks. It may, however, not appear for twelve or fifteen weeks, and as in

the case just mentioned, may never appear, mucous patches or tertiary lesions first proving conclusively that the initial sore was a chancre. This will be the case if mercury is given before the secondary rash appears, but this condition is observed occasionally when no mercurial treatment has been given.

The secondary eruption develops slowly, is painless, and does not itch. The eruption is copper colored, the spots rounded in form and tend to scale somewhat. The eruption is symmetrically arranged, following the lines of cleavage in the skin, and disappears with mercurial treatment. There is a late secondary eruption coming in the latter part of, or after the first year. These lesions do not appear as a general eruption, but are grouped upon certain regions of the body which are subject to irritation. They are often seen on the face, especially on the parts which are irritated by shaving. These lesions are rounded in form and tend to group in circles, giving the appearance somewhat of ringworm. They are usually slightly scaly, but may be ulcerated, in which case they form punched out chronic ulcers, often covered with raised, thick, black looking, adherent crusts.

ERUPTIONS OF THE MUCOUS MEMBRANES.

Involvement of the mucous membrane of the mouth is one of the most constant symptoms of constitutional syphilis. It often occurs even before the skin eruption, and as has been mentioned before, may be the only secondary symptom noticed. It may appear in the form of an erythema involving the mucous membrane of the tonsil and palate and possibly the pharynx, and resembles the ordinary sore throat which we see as a result of taking cold.

Most commonly however we see the so-called mucous patches. These lesions are highly infectious and are the ones which the dentist in his daily work must be constantly on the watch for. These lesions are commonly found on the tongue, the mucous membrane of the cheeks, the tonsils, the pillars and the palate. They may rarely be found on the mucous membrane of the pharynx. They appear as greyish white, irregularly shaped markings, not elevated above the surrounding mucous membrane. The lesion resembles that produced if the mucous membrane is touched with a silver nitrate pencil, or as if a thin

film of egg albumen had been painted on the mucous membrane. The margins of these lesions are however rather sharply defined.

The tongue may be eroded and even fissured, especially on the sides. Sometimes the upper surface of the tongue presents a sort of moth-eaten appearance. These lesions are at times more or less painful. To distinguish between a mucous patch and the ordinary stomatitis is at times impossible, that is from the lesions alone.

The lesions of stomatitis are generally more tender, develop in a day or two, run a rapid course, and are well in a few days, while the mucous patch persists unless given special treatment. At times a diagnosis cannot be made without a history of an initial lesion, or some definite symptom of syphilis. The sight of these even suspicious lesions should put us on our guard.

ALOPECIA.

The irregularly patchy alopecia needs merely to be mentioned as it is a very striking symptom which would not escape notice.

Fournier states that in his opinion an alopecia confined to the eyebrows alone is nearly diagnostic of syphilis.

TERTIARY LESIONS.

While the tertiary lesions of syphilis are not as infectious as the secondary, and by some authorities are regarded as non-infectious, still tertiary lesions may appear while there are still some secondary symptoms, so a brief mention of tertiary manifestations may not be out of place.

The tertiary lesions, or gummata may develop both in the mucous membrane and in the submucous connective tissue. The mucous gummata appear as small rounded tumors up to the size of a pea, which quickly break down, forming punched out ulcers of an unhealthy appearance with a reddened, infiltrated circumference. These lesions are most often seen on the hard and soft palate. The submucous gummata are larger and form deeper, punched out ulcers.

Occasionally there is noticed a distinct pyorrhoea-alveolaris, which is a result of syphilitic disease of the alveolar process.

Gummata of the hard palate usually begin in the periosteum near the median line. These, if allowed to go on, result in

necrosis of the bone and direct communication between the nasal and oral cavities.

Gummata of the soft palate usually appear on the oral surface, and if untreated ulcerate, and cause perforation.

Gummata may appear in the pharynx and in the tonsils, and have practically the same appearance as those already mentioned. Starting as hard nodular swellings, which soon break down forming the characteristic deep, punched out, unhealthy looking ulcers with reddened infiltrated edges.

Subperiosteal gummata, resulting in caries and necrosis, are most frequently observed on the hard palate, the alveolar border of the upper jaw at the insertion of the incisor teeth, and the posterior wall of the pharynx.

The mention of a few cases which have come under my notice may be of interest. These are cases of syphilis which have been acquired innocently.

1. A girl, 22 years of age, presented herself at my surgical clinic at the Carney Hospital, with a "cold sore" on her lip, which had persisted for several weeks in spite of treatment. She had an indolent looking sore on her lower lip surrounded with an area of marked induration. On looking over the body a beginning secondary eruption was seen, making the diagnosis absolutely certain. This girl worked in a shoe factory in a neighboring city. She said that five other girls who worked in the same room with her had similar sores on their lips. This infection was probably spread by the use of a common drinking cup.

2. A doctor of my acquaintance developed a chancre on the end of his index finger. He was unable to trace its source, but was almost certainly infected during some throat operation.

3. A surgeon of this city scratched his finger on a ragged tooth while making a digital examination of a patient's mouth. A chancre developed in the wound in about three weeks.

4. I have a patient at present under treatment whose chancre appeared on the tonsil. He had no idea where the infection was acquired.

5. I know personally of two other doctors who received their infection on the finger, one in making a rectal examination

and the other during a vaginal examination. These were in cases where there was apparently no possibility of a syphilitic infection.

I could continue these instances, but a few will suffice to show that we are continually exposed to infection where least expected.

Does the social position of a patient insure against syphilitic infection? Absolutely no! In fact there is a very true saying among naval surgeons that "Soft chancres are found in the fo'cas'l', and hard ones in the after-cabin." Now, knowing the many chances of receiving or transmitting this infection in dental and surgical work, what are we to do to minimize these chances? Should we refuse to treat a patient of whom we are suspicious? I should say no; but we can protect our hands, and sterilize our instruments.

Rubber gloves or finger cots will protect the hands, and in my opinion the only safe way to sterilize instruments is by boiling. Dipping the ends of instruments in an antiseptic solution will not suffice, for it may not be the point, but the handle, where it presses against the patient's lip, which carries the infection.

Antiseptic solutions, if used in sufficient strength to surely sterilize an instrument will usually cause some erosion or other damage to the instrument. The instruments which the dentist uses which are most likely to carry infection are extracting forceps, the clamp used to hold rubber dam in place, and the rubber dam itself. I am informed that most dentists use a fresh piece of rubber dam for each patient, which to my mind is the only cleanly and safe thing to do, but I know of more than one dentist who merely washes his rubber dam with soap and water before using it on another patient.

Constant boiling will spoil a mirror, but the expense of renewing a mirror at frequent intervals would be a small matter beside transmitting a syphilitic infection, for as has been mentioned before, the blood and secretion from a person in whom there are no outward signs of syphilis, may be highly infectious.

I have a patient who is in the first year of her infection, who had made an appointment with her dentist, and the fact that she casually mentioned the fact to me is all that prevented her

from keeping the appointment. Her outward symptoms had all disappeared, but she was still in the infectious stage of the disease.

Knowing that a syphilitic patient with no apparent signs of the disease may be nearly if not quite likely to spread the infection, how are we going to protect ourselves and our patients?

The only safe rule for us in our work is to regard every patient as a source of infection and govern ourselves accordingly.

A STUDY OF SULPHOCYANATES IN SALIVA AND OF
SOME LITERATURE ON THE SUBJECT.*

BY J. MORGAN HOWE, M. D. S., M. D.

Saliva has been considered worthy of study by some medical writers, but not to the extent that it seems to deserve, and dentists should know much more than they do about it and the causes of its various characteristics, that they may make intelligent efforts to prevent dental disease. The salt we are to study is referred to by some writers as sulphocyanide and by others as sulphocyanate, all meaning the same substance. I shall use sulphocyanate, except when quoting others, as I believe it is more in accord with present chemical terminology.

Works on physiology give analyses of saliva, which record the amount of sulphocyanates as very small, varying between .10 and .04 of a part in 1,000 of saliva; accompanied by the statement that it is "sometimes or often" absent, and that it is found in *greater amount*, or *is more often found*, in the saliva of smokers than in that of others. The tests made in this study of sulphocyanates tend to confirm the statements that smokers have a larger amount of this constituent in their saliva than others, although this is contradicted by at least one writer. Both medical and dental students of the subject have attached importance to the varying percentage of sulphocyanate, some of them to the exclusion of a consideration of other constituents. It does not seem clear to the writer that the amount of other constituents and their relation to the one under consideration may not have as much significance and importance. Some writers have made positive statements of its influence on decay and erosion, or that these lesions were related to the amount of this constituent as effect and cause. Schafer's Physiology says: "An exalted importance has been given to the sulphocyanates in saliva from its supposed origin from proteid metabolism." But following this the author states that, from its relation to cyanic acid, its sulphur atom merely replacing the oxygen "from its presence in urine and in traces in the blood, it is probable that the sulphocyanate of the saliva is a product of proteid metabolism." Fenwick

* Read before The New York Institute of Stomatology, April 6, 1909.

is quoted by this author as stating "that the amount of sulphocyanate in saliva bears a relationship to the amount of sulphur (as taurocholates) in the bile." Pepper in his *System of Medicine*¹ says: "The saliva which is normally alkaline, has usually a decided acid reaction in acute articular rheumatism, and Dr. Bedford Fenwick states that it always in this disease contains a great excess of sulphocyanates. These slowly diminish till at the end of the third week or so they become normal in amount."

In 1882 Samuel Fenwick, M. D., F. R. C. P., read a paper before the Royal Medico Chirurgical Society of London on the "Variations in the Amount of Sulphocyanide of Potassium in the Saliva of Persons Affected with Different Diseases." It is worthy of careful consideration, and I will try to indicate some of its conclusions. As far as I know, he is the only writer on saliva who has tried to establish a standard of the normal content of sulphocyanate. He collected for this purpose saliva "from a number of healthy persons," and the color produced by adding seven minims of a perchloride of iron solution—half a drachm to an ounce of water—and the tint produced "was taken as the normal amount." "A portion of the same saliva was then evaporated to a quarter, and another to half its bulk, and the colors produced in these respectively were assumed to represent four times and twice the normal quantity of sulphocyanide; while two other portions diluted with water to twice and four times their amount were taken as representing half and a quarter of the normal quantity of the salt." This seems to be an intelligent method, although it would have been more accurate if the amount of saliva used in each test had been stated, and it would have been more certain that the alleged healthy person's saliva was normal if their teeth had been examined and found free from lesions. One who gives the subject thought would hardly conclude saliva to be normal taken from a mouth in which the teeth are subject to progressive lesions. Further on the statement is made by Fenwick that some physiologists have asserted that sulphocyanide in saliva is accidental "and is the result of decomposition set up by decayed teeth." To test this he had 87 hospital patients' teeth examined, and found 18 per cent. with teeth "quite perfect," having a normal or excessive amount of sulphocyanide, and 14 per cent. in whom it was

¹ Pepper's *System of Medicine* Vol. 11, p. 30 (1885).

deficient. Of cases in which one or two teeth were decayed, 47 per cent. were normal or excessive in sulphocyanides and 44 per cent. were deficient, and in cases having many decayed teeth 35 per cent. had normal or excessive amount of sulphocyanide and 42 per cent. had a deficient amount.

Again he says: "Others have attributed the presence of sulphocyanide to the smoking of tobacco, and the habits of 213 patients in the hospital were investigated as to this point. On analyzing these cases it appeared that of those whose saliva contained an excess of sulphocyanide, 6 per cent. only had latterly smoked; of those presenting a normal quantity only 2 per cent., whilst of those in whom there was a deficiency, 8 per cent. had latterly consumed tobacco, and one represented himself an excessive smoker. It is evident, therefore, that no material influence is exerted by the use of tobacco, although my own impression before analyzing these cases was that the sulphocyanide is usually present in greater quantity in the saliva of those who smoke than of those who abstain from tobacco."

In pathological conditions Dr. Fenwick found a deficiency or absence of sulphocyanide in the saliva of patients suffering from jaundice from obstruction. He states that it seems probable that in order that this salt should appear in the saliva, bile must be able to enter the duodenum. He found also a deficiency in all conditions in which the amount of food digested or absorbed is diminished. Such as (a) oesophageal stricture, (b) gastric cancer, (c) atonic dyspepsia, (d) persistent vomiting, (e) long-standing diarrhoea; and the effects of lead poisoning, also in neuralgia.

He found the sulphocyanide in saliva above the normal in quantity in a majority of those who had a good appetite and ate freely, and in those who were stout or fat. He concluded that such excess of the salt represents an excess of nutriment beyond the requirements of the system. This he thought to be the rule, although it did not explain all cases. Then he found an excess also in cases of acute rheumatism, and in gout, though not so great an excess as in rheumatism; also in eczema and urticaria, in bilious headache traceable to gouty conditions; in the early stages of all febrile and inflammatory affections, as in gastric catarrh, and recent gastric ulceration, or other inflammatory affec-

tions; in phthisis; in early stages of kidney and heart disease. He says, near the end of his paper: "I have, I trust, been able to prove that the presence of the sulphocyanide in the saliva is not due to accidental circumstances, but is regulated, as in the case with the secretion of other glands, by the operation of general laws."

It seems as if Dr. Fenwick's studies should be of great value to all who study saliva.

Dr. J. P. Michaels, of Paris, has studied the saliva more, probably, than any other practitioner of dentistry, and seems to regard the amount of sulphocyanate as the cause of, or the indicator of qualities having relation to dental lesions. In June, 1899, Dr. W. H. Potter read a resumé of a translation of a paper by Dr. Michaels before this institute. He said: "In . . . subjects presenting chemical abrasion of the teeth . . . sulphocyanide of potassium or ammonium was present in the salivary secretions in a quantity more than normal." He couples the analysis of saliva with that of sweat and finds many dental lesions associated with the acid diathesis. Dr. Potter, epitomizing what Michaels presents in this paper said: "The object of the writer is to connect certain dental lesions, and in particular so-called chemical erosion, with the presence of an increased amount of sulphocyanides in the saliva." Later in the author's description of cases he details one in which extensive erosion had taken place whose saliva possessed "double the amount of sulphocyanides to be found in normal saliva. The sulphocyanides were ammoniacal salts and not potassium salts as found in normal saliva." But in another case of extensive abrasion with extreme sensitiveness, "tests for sulphocyanides showed a small amount in the saliva, but a strong ammoniacal reaction." This last case appears to present an exception to the rule sought to be established, that there is an excess of sulphocyanates in the saliva in cases where erosion affects the teeth.

Dr. Michaels presented a further contribution on this subject to the International Dental Congress in 1900, entitled Sialo-Semilogy, which is a very painstaking piece of work, for which he deserves full credit; it does not contain, however, any definite statement of the amount of any constituent in saliva, and, notwithstanding numerous references to variations from the normal

amounts of constituents, he does not tell his conclusions as to range within which the content of any constituent is normal. He appears to attach considerable importance to sulphocyanates, and states his conclusion that "sulphocyanides are constantly present in the saliva of rheumatic individuals (oxaluric form) and characterize a definite diathetic state. The proportion varies according to the period of the diathesis . . . pronounced when the diathesis is in the active condition. In the gouty diathesis (uric) the proportion of sulphocyanide is very slight," and further on he records that "potassium in combination with a sulphocyanide causes chemical abrasion of the teeth." These statements seem to be out of harmony with the quotation given from the former paper, where the erosion effects appear to be attributed to the ammoniacal salt and referring to "potassium salts as found in normal saliva"; and they also appear to disagree with the classification of constituents in the Synoptic Table (IX) on the "Correlation between the presence of sulphocyanides of ammonia and Dental Caries," referring to the relative amounts of ammonia and "acid sulphocyanides" as characterizing the different diathetic states, and to conditions of immunity to caries on the one hand, or "active fermentation and rapid putrefaction" on the other. It is possible that the title to this table may not be accurately stated in translation,² and thus mislead one as to the author's meaning; but it is notable that there is an absence of definite amounts or percentages in recording, *equality, slightly, moderately* or *strongly superior* to one or the other of these two constituents, as they are said to appear in the different conditions named. These omissions would make it difficult to compare the author's work with that of any other investigator. Dr. Michaels' work seems to lack definiteness, and there appears to be an absence of standards by which his judgment of conditions, either normal or pathological, can be estimated relatively with the work of any other person going over the same ground.

Marked significance is attached to the amount of sulphocyanates in the saliva by Dr. F. W. Low in a report of a committee on Scientific Research to the Dental Society of the State of New York, in which he said: "We still find, just as we did last year, that in proportion as the sulphocyanate provings are excessive in

² Translation published by S. S. White Dental Mfg. Co. 1902.

saliva the teeth are comparatively immune from dental caries, while, on the contrary, in those persons in whose saliva we have discovered *no* sulphocyanate, we have as invariably found soft, ill calcified and carious teeth." In a discussion of the report from which this quotation is made Dr. E. C. Kirk said: "A great deal of study has been made as to the existence of sulphocyanide of potassium in the liver, and the work done in that direction, notably by Fenwick, is significant." An * refers by foot note to the *Lancet* of 1877, Vol. 11, p. 303, as to Fenwick's study, and on reference to this article it is found to be a *Lecture on the Presence of Bile in the Saliva*, by Samuel Fenwick, M. D., F. R. C. P., and refers to bile, its coloring matter and its salts in saliva, but makes no reference to sulphocyanates either in the liver or in the saliva. It is, however, an interesting paper, referring mostly to jaundice, by the diversion of bile from the alimentary canal.

An interesting paper on saliva and tooth decay was read before the North Eastern Dental Association by Dr. J. Wright Beach³ in October, 1907, in which he quotes from a paper by Dr. F. W. Low read before the Western New York Hom. Med. Society, stating that he had failed to find any "chemical constituent persistently abundant in the mouths of individuals having remarkably poor teeth," but in investigating the saliva of individuals having remarkably good teeth he made what he believed to be "an important discovery, namely, the almost invariable presence of generous provings of potassium sulphocyanate." He further quotes that Dr. Low claims to have proved by experiment that saliva having an abundance of potassium sulphocyanate will dissolve gelatin to double the quantity of such as have none; that saliva from an individual immune to decay shows "strong potassium sulphocyanate provings," while in the same mouth during a period of rapid decay the saliva contained none of that constituent; that in a mouth where decay was rapid and the saliva showed no sulphocyanate, the administration by the stomach of one-half grain per day of that compound, the saliva showed that constituent abundantly; and that the habit of photographers of washing the hands in potassium cyanid solution to remove silver nitrate stains results in an increase of sulphocyanate in the saliva, and that comparative immunity from decay results. Dr. Beach adds

³ Dental Cosmos, May, 1908.

to these statements of Dr. Low's that "the established and well-known fact that smokers show immunity from decay in proportion to the duration of the habit and the amount of tobacco consumed. The reason for this is that the saliva invariably shows potassium sulphocyanate provings," and further he says he is of the opinion, "fortified by experience, that the administration of hydrochloric acid, as in cases of indigestion . . . will . . . cause the presence of potassium sulphocyanate in stable quantities in the saliva." Dr. Beach claimed nearly three years of clinical work and the testing of nearly three hundred specimens of saliva and is satisfied that potassium sulphocyanate retards caries and renders teeth less sensitive.

I regret inability to confirm the statement here made as to the immunity of smokers' teeth to decay. Many years ago, having an office in close relation—in the same house—with that of the late Dr. J. B. Littig, the question of the possible good effect of tobacco smoking on the teeth was observed by us; and many of our patients who were smokers were examined and observations compared. With an initial prejudice in favor of the supposition, we had the subject under consideration for a considerable time, and we finally agreed that smokers' teeth, in our opinion, were not influenced favorably in regard to decay by the habit. In the years that have passed since, in the examination and treatment of many smokers' teeth, the old query has been in mind, and although by the saturation of disintegrated dentine, when removed from cavities in smokers' teeth, it was sometimes so redolent with the odor of tobacco that it neutralized or overcame the usual offensiveness, yet the conditions as they appeared have never given cause to change the opinion that decay of smokers' teeth is not inhibited in any degree by that habit; but they are susceptible or immune in varying degrees from other causes, as are other people's. It seems to be a fact—which may well be subjected to further revision—that their saliva does contain more sulphocyanates than the saliva of others, and if that is true, the observation of clinical conditions of smokers' teeth just referred to makes it seem doubtful that an increase of sulphocyanates will of itself have the effect of inhibiting decay. It seems proper that I should admit that I am myself a tobacco smoker, so that it may be known that my opinion is not influenced by an adverse prejudice.

The quoted statement that immunity from decay exists in proportion to time and degree of the smoking habit, and is an "established and well-known fact," is so at variance with the observations above stated that it seems quite important that practitioners should observe conditions of teeth as related to the habit of tobacco smoking, and make some record of such observations, in order that there may result a final unanimity of opinion.

Both Dr. Low and Dr. Beach refer repeatedly and always to the sulphocyanate salt in the saliva as that of potassium. Whereas Dr. Michaels has found it to be the ammonium salt in some cases, and works on physiology generally give the sodium and magnesium salts, as well as potassium salts, as contained in normal saliva.

Bernard R. Le Roy, M. D., of Athens, O., has published a paper⁴ on the "Colorimetric Analysis of the Saliva with the Clinical Significance," in which he gives in detail methods of determining the presence of the constituents of saliva, and also the significance which he attributes to their variations in amount. He has applied such analyses to the diagnosis and prognosis of pathological conditions in general practice. In collaboration with Dr. William Bentley, Dr. Le Roy has also published a paper⁵ on "The Solvent Action of the Sulphocyanates upon the Lime and Magnesium Deposits in the System," in which Dr. Bentley gives the results of laboratory experiments on the solvent action of weak aqueous solutions of potassium sulphocyanate on renal calculi, showing loss of weight; and Dr. Le Roy records clinical observations that "there is always a precipitation of the calcium and magnesium held in solution in normal saliva, by an increased content of ammonia and a simultaneous decrease or entire absence of the sulphocyanates." He says that "when the saliva was normal the basic salt was one of potassium, ammonium and the sulphocyanates in small and about equal quantities, the lime and magnesium present held in perfect solution, but that in all cases of departure from the line of health was noticed deposits of more or less of the lime salts in and around the teeth. This condition could in a measure be remedied by the administered medicinal dose of sodium sulphocyanate. . . . This fact led me to use it in cases of arteriosclerosis in small doses, giving prompt and

⁴ N. Y. Med. Journal—March 7, 1908.

⁵ Ibid. Aug. 1, 1908.

rapid relief to the patient." He had used this remedy with success in arteriosclerosis and in all cases where he found high blood pressure, for some years, before he learned that Dr. W. Pauli, of Vienna, had experimented with the sulphocyanates also, and had published favorable results of the administration of the salts.

Pauli⁶ has published many valuable and interesting facts regarding sulphocyanates, and other salts; results of his own, or others' investigations; as, for instance, that sulphocyanates occur in the urine and in the conjunctival and olfactory secretions, as well as in the saliva; but where in the body the salt is formed is still unsettled. Long has shown, however, that "all cyanides and nitrils are converted into sulphocyanates in the organism, probably through a process of association with the neutral sulphur of the proteins."

Among the electrolytes it is classified as an anion, and inhibits precipitation of proteins or dissolves precipitates already formed. Even small doses of sulphocyanates alter the metabolism, and a single dose was discovered by Munk in 1877 to bring about "an increased secretion of this substance a week later. The excretion of sulphocyanate is decreased when iodine is taken, and completely stops when iodism is produced."

Pauli reports the results of therapeutic experiments with sulphocyanate, that it "possesses, as a rule, a well-marked sedative action upon the pathologically excited nervous system," and diseases which have the symptom of increased blood pressure in common were generally benefited. "A steady drop in blood pressure amounting to from 10 to 25 per cent. . . . could be observed in a few days," . . . but there was generally a return of blood pressure when the drug was stopped. On the whole, he regards favorably the effects of sulphocyanate therapy, and as being an advance on the use of iodides in a number of diseases, including advanced syphilis. He discovered in these experiments that the drug is capable of producing an acne, and also a rhinitis, which facts suggest caution in its administration.

A consideration of all this testimony must convince us that the saliva should be studied with reference not only to its influence on dental lesion, but also in its relation to general systemic conditions. And that as broad a foundation of facts as possible should be laid before attempts are made to generalize.

⁶ Physical Chemistry in the Service of Medicine.

Consideration of the subject has impressed the idea that as great a degree of accuracy as possible should be established in the work of analysis and record. After some trials of using porcelain disks, as suggested in Dr. Le Roy's paper, the following method was adopted: 1 c. c. of filtered saliva in a test tube was used, and 3 drops of ferric chloride, 5 per cent. solution, was put into it, using the same dropper each time. The color reaction after shaking was then held against a white background, and matched as nearly as possible with the color of one of Dennison's colored tissue papers. In some cases when very slight color reaction appeared, leaving doubt whether any sulphocyanate was present, a control tube of 1 c. c. of distilled water with 3 drops of the same ferric chloride solution was compared with it side by side. By this method a small content of sulphocyanate was made evident, that might have escaped detection by the method of dropping the reagent into unfiltered saliva in a porcelain disk. The same method has also been followed in analyzing for other constituents of saliva. For the method of matching the reaction color to⁷ Dennison's tissue colors, I am indebted to Mr. H. Carlton Smith, Professor of Chemistry of Harvard Dental School. I consider it very valuable, because it gives a means of record, by noting the letter and number of the particular paper, or by pasting a bit of the paper on the record, or both; and it also furnishes a ready means of comparison with other analyses, of the same patient or another, or of comparison with the work of others.

The approximate relative amount of the constituent represented by the color reactions obtained was arrived at by making definite percentage solutions of the chemical compounds themselves in distilled water, and subjecting them to the action of the reagent as before mentioned, in the same amounts as was used for the reactions with saliva. The color reactions obtained as above mentioned by the definite solutions of potassium sulphocyanate and of sodium sulphocyanate were the same, and were matched quite closely by Dennison's tissue colors. In this way it was ascertained that the highest content of sulphocyanate in saliva obtained from any analysis made, which for convenience is designated as No. 7 on the list presented, was matched in color by Dennison's tissue color B. R. 2, and represents approxi-

⁷ Dennison's tissue colors Catalog. Dennison Mfg. Co.

mately 1-50 of 1 per cent. in sulphocyanate, or 1 part in 5,000. In testing saliva, some colors were obtained intermediate in intensity to those here given, so an arbitrary division indicated by numerals was made to designate them from 7 to 1.

The colors obtained in definite aqueous solutions were as follows:

Dennison's color B. R. 2 matched color reaction of 1-50 of 1 per cent.

Dennison's color O. 6, matched color reaction of 1-100 of 1 per cent.

Dennison's color O. 5, matched color reaction of 1-200 of 1 per cent.

Dennison's color O. 3, matched color reaction of 1-300 of 1 per cent.

Dennison's color O. 2, matched color reaction of 1-500 of 1 per cent.

Dennison's color O. 1, matched color reaction of 1-1000 of 1 per cent.

The arbitrary classification made is as follows:

No. 7 represents 1-50 of 1 per cent. or 1 to 5,000.

No. 6 represents 1-100 of 1 per cent. or 1 to 10,000

No. 5 represents 1-200 of 1 per cent. or 1 to 20,000.

No. 4 represents 1-250 of 1 per cent. or 1 to 25,000.

No. 3 represents 1-300 of 1 per cent. or 1 to 30,000.

No. 2 represents 1-500 of 1 per cent. or 1 to 50,000.

No. 1 represents 1-1000 of 1 per cent. or 1 to 100,000.

No. 0 represents less than the above (No. 1), but no case was found that did not show some reaction of sulphocyanate, since the method described above was adopted, viz., of making the reaction in a test tube, and comparing with a control.

The test tubes used were of $\frac{1}{2}$ inch diameter, but it was found on trial that variation in size of test tubes near that calibre did not make a noticeable difference in the appearance of color. This method of analysis and record seems desirable because it can be used by all those desiring to make salivary analyses, in various localities, and their results can be compared with those obtained elsewhere and recorded.

I have charted 104 records of analyses of saliva according to a method kindly shown me by Mr. H. Carlton Smith, and tabulated them for the purpose of discovering the content of sulpho-

cyanate and its relation to the susceptibility to decay. They are the first 104 cases taken consecutively after adopting the method of analysis and record described above.

Of these, there were ten cases classed as least susceptible to decay. One of these was a case of immunity. It was No. 3 in our classification of content of sulphocyanates, that is, below the average percentage. Taken with the other nine cases classed as very slight decay, the nearest to immunity. They ranked in sulphocyanate content as follows:

One case was No. 6, or 1 part in 10,000.

Two cases were No. 5, or 1 part in 20,000.

Two cases were No. 4, or 1 part in 25,000.

Four cases were No. 3, or 1 part in 30,000.

One case was No. 2, or 1 part in 50,000.

An average for the ten cases of 3.8, meaning 1 part in less than 30,000 of saliva.

At the other extreme 5 cases were judged most susceptible to decay, extremely bad. They ranged as follows in our numbered classification:

One case was No. 6, or 1 part in 10,000.

Two cases were No. 4, or 1 part in 25,000.

One case was No. 3, or 1 part in 30,000.

One case was No. 1, or 1 part in 100,000.

An average for the five cases of 3.6, meaning a very slightly less average of sulphocyanate than the cases nearest to immunity.

If now we divide the 104 cases in which analyses of saliva are recorded in our list into two classes, we will put those classed as moderate in susceptibility, 38 cases, those classed as having very slight susceptibility, 9 cases, and our one case of immunity together, making 48 cases in all. Of these—

Two cases are classified in sulphocyanate as No. 7.

One case is classified in sulphocyanate as No. 6.

Six cases are classified in sulphocyanate as No. 5.

Thirteen cases are classified in sulphocyanate as No. 4.

Fourteen cases are classified in sulphocyanate as No. 3.

Seven cases are classified in sulphocyanate as No. 2.

Four cases are classified in sulphocyanate as No. 1.

One case is classified in sulphocyanate as No. 0.

The average classification in sulphocyanate content would be No. 3.395.

When if we take the remainder of our list, representing the more susceptible cases to decay, we have 51 cases classed as marked decay, and five classed as very marked decay. Of these—

One case is classed in sulphocyanates as No. 7.

Two cases are classed in sulphocyanates as No. 6.

Five cases are classed in sulphocyanates as No. 5.

Thirteen cases are classed in sulphocyanates as No. 4.

Fifteen cases are classed in sulphocyanates as No. 3.

Eight cases are classed in sulphocyanates as No. 2.

Seven cases are classed in sulphocyanates as No. 1.

Five cases are classed in sulphocyanates as No. 0.

Multiplying the number of cases of the same content in sulphocyanate by its classification number and dividing the sum of these products by the total number of cases, we have here an average classification of 3.017. But even in this small difference between the least susceptible cases to decay and those most so, it should not be overlooked that five cases in the latter list classed as 0, each one did have a reaction for sulphocyanate, but it fell below our No. 1, approximately, 1 to 100,000 of saliva.

It is noticeable that in the one case of immunity from caries I have been able to present in the tabulated records had a sulphocyanate content represented by the color O.3, meaning approximately only 1-300 of 1 per cent. or 1 part to 30,000 of saliva. The patient was a young lady 19 years old, never had been in a dentist's chair before, had 28 teeth, all sound, without decay, gums healthy, molars slightly stained, admitted she had been careless about brushing her teeth. The saliva was viscid and ropy. Since the records were tabulated I have been able to secure analysis of another case of immunity. A man of about 50 years, apparently in good health. He has quite a number of filled teeth, but has been immune for several years from caries; for some time has used only a soft rubber tooth brush, has no tartar and very slight staining of the teeth, and his gums are normal. The amount of sulphocyanate in his saliva, made the reaction color O.2, only about 1-500 of 1 per cent. or 1 part in 50,000. Both these cases in which the saliva seems normal, so far as its influence on teeth is concerned, have a low content of sulphocyanate. The saliva in both cases viscid and alkaline in reaction. They both had also only a small amount of ammonia, and in that respect they agree with Dr. Le Rov's statement, already quoted, of

what the normal and relative amount of these two constituents should be—"small and about equal in quantity." I will refer to one more case aside from the tabulated record. A young lady decidedly susceptible to decay of teeth, especially at the cervix in the proximate spaces. Analysis of saliva January 6, 1909, gave sulphocyanate reaction O.4, about 1-250 per cent. or 1 part to 25,000, a somewhat larger amount of that constituent than either of those immune to caries. The reaction was very strongly alkaline, and the fluid rather viscid. The ammonia showed reaction color Y. 7. March 8, 1909, analysis showed a fall in sulphocyanate to 0.3, or 1-300 per cent., 1 part to 30,000, also a much greater fall in ammonia, Y. 2 very low indeed, and great increase in alkalinity. Here we have decay actively progressing with the amount of sulphocyanate higher or equal to the cases in which immunity exists. It seems evident that a wider field of inquiry is needed to be able to assign a reason for the difference in the influence of saliva on the teeth than the amount of the one constituent we are considering. I do not think that these results of analysis, either as tabulated or as described individually as to content of sulphocyanate, prove anything as to the relation of that salt to the condition of the teeth, but they are certainly not favorable to the conclusion that a large amount is required to inhibit decay, neither do they substantiate the supposition that a relatively small amount means great susceptibility. Some patients most susceptible to decay had a very large content of sulphocyanate, and the only two cases of immunity had a very much smaller amount, and so far as they go they point to the same conclusion—more study needed. It seems to me probable that balance of chemical composition, which may vary in different individuals, is the requisite of normality, just as it seems evident that caries may be actively progressing with saliva, analysis of which shows in different mouths, various contradictions. The foundation of ascertained facts must be laid broad and deep before we can expect to determine how much the constituents of saliva may vary within normal boundaries, and what their amounts should be relatively to each other and to the fluid itself. The teeth are the most evident indicators of a physiological condition of oral fluids or of a departure from it. No one could reasonably claim to determine the analytical constituents of normal saliva without knowing that the dental tissues were normal, and as the scientific world is only

just now beginning to recognize the importance of teeth, it is very doubtful if any of the analyses given in works on physiology have been made after such knowledge of dental condition was obtained. When we consider the different effects on teeth produced by the mixed saliva in mouths such as the two cases cited in which immunity to decay exists, with indifferent efforts at cleanliness, and the conditions on the other hand, so familiar to dentists, where the teeth are subject to constantly recurring decay or erosion, notwithstanding persistent efforts of both dentist and patient to prevent, the necessity of more intelligent and more extended study of this secretion, and of the causes of such variations in quality, are more than ever impressed on our minds. It seems the only way that offers a prospect of instituting prophylactic measures that will really be effectual. Dentists can in no other way deserve and receive the gratitude of mankind so surely as by a deliberate and persistent effort to solve the problem for prevention of dental destruction. The results of the thorough mixture of saliva with food in the mouth, as shown by the evidence presented in the works of Mr. Horace Fletcher, seem to effect the digestive processes all the way down to the colon; and although the characteristics of excrementitious matter—the feces and urine—are justly deemed worthy of most careful study, the saliva has received such scant consideration. It is greatly to be hoped that both physicians and dentists will undertake to solve the problems of normality and depravity in saliva.

The diagnostic value in systemic disease must be as Dr. Le Roy states, very valuable. The causes of its almost general depravity, as shown by the condition of the teeth, seems likely to prove among the important reasons of physical deterioration. Dentists cannot expect to make much progress without the interest and co-operation of physicians and physiological chemists, because saliva, as well as the one constituent—sulphocyanate—as Dr. Fenwick wrote, “is regulated, as in the case with the secretion of other glands, by the operation of general laws.” Neither can physicians be very accurate in determining normal or pathological conditions of saliva without the special knowledge of the dentist of its effects in any given case on the teeth.

In conclusion, I would urge the organization of those who are willing to work at the problem of the variations in saliva and their causes, and their effects on teeth. There is good reason to

hope that agreement among investigators upon common methods of investigation and record would result in the most rapid advance attainable in knowledge of the subject. The list of those who have ascertained certain facts regarding saliva is a long one, but they are disjointed, and for the most part unrelated to such a degree as to make them of little practical value. Drs. Fenwick and Le Roy seem to give the clearest account of what they have done, and the conclusions they reached, as to the significance of ascertained facts.

Dr. Fenwick tried to establish the normal standard of sulphocyanate in saliva, but the method adopted could make it useful only for his own guidance. His work is quoted by Prof. V. Jaksch, of Prague, at some length, in his *Clinical Diagnosis*. Dr. Le Roy arrived at the conclusion as to the normal amount of sulphocyanate relative to ammonia by his clinical studies, which he states clearly, and all his observations should be of service to students of the subject. It is to be noted also that the teeth have not escaped his consideration. But from the viewpoint and purpose of dentists the condition of teeth should be given special and expert examination, together with all available data concerning general systemic condition.

Dr. Michaels very truly states: "Theoretically, the idea of a physiological saliva in which all the biochemical principles are in a state of equilibrium is easy to conceive, but in practice its realization is very rare; we mean the saliva of a human adult without any diathesis, and with healthy teeth." But it may be supposed that some systemic disorders would not necessarily vitiate the saliva. Perfect health in all tissues and organs is truly very rare, but as the most obvious index of a physiological balance in the constituents of saliva is the condition of the dental tissues, it would probably be fair to conclude, when the teeth and gums are normal, that whatever diathesis exists in the body has had little effect on the saliva. I would suggest that this would be a reasonable tentative starting point for the determination of what normal saliva is. Our dental writers have failed, as far as I know, to define what they consider a normal amount of any constituent, although referring frequently to a deficiency or excess.

I am indebted to Dr. A. B. Leavitt for assistance in the work of analyzing specimens, and for general co-operation. I shall

welcome criticism of what is here presented. The statements have been made as definite as possible in order that both methods and results may be subject to review, and it will be a cause of gratification to have any facts substantiated, by either confirmation or refutation, of what is here put down.

THE OPSONIC TREATMENT OF PYORRHOEA
ALVEOLARIS.*

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The consideration of the treatment of Pyorrhoea Alveolaris, as in that of any other form of disease, presupposes primarily a knowledge of the cause or causes of the malady. Unfortunately, a clear and definite source, applicable to all cases, has not as yet been discovered. The fact that so many various conditions have been suggested, seems to the writer to prove that no one of them can be attributed to all cases. Among the diseases and conditions brought forward as predisposing agents, may be mentioned: diabetes, Bright's disease, syphilis, rheumatism, gout, heart disease, liver affections, and autointoxication from faulty metabolism. Certain forms of nervous disorders also, and the presence of localized collections of pus in various portions of the body, have been suggested. The question always arises, also, whether calcareous deposits on the teeth cause Pyorrhoea, or whether Pyorrhoea cause calcareous deposits. It will thus be seen that with so many causes at work, the observer can scarcely say that any given condition is the real reason for the disease at all, or even in many cases. For example, one of the writer's cases was told that the sole cause of her trouble was autointoxication from faulty metabolism. She immediately placed herself under the care of an intelligent dietetic expert in New York, where she remained six months. During that time her general condition was greatly improved, but, in spite of careful dental treatment, she lost three teeth, and the progress of the disease was not checked.

It will probably be admitted by all that the underlying condition in Pyorrhoea, from whatever source, is an inflammation of the connective tissue of the gingiva in varying degree, associated in many cases with the presence of pus. Having had considerable experience with opsonic treatment in many other surgical forms of bacterial infection, it recurred to the writer that it

*Read before The New York Institute of Stomatology, May 4th, 1909.

might be possible to apply these principals to the opsonic treatment of Pyorrhoea. Here we have a definite localized condition of inflammation where, theoretically at least, opsonic treatment should be of avail. The question at once arose whether or not Pyorrhoea in every case might not be caused by a deficiency in the normal protective substances found in the blood of the patient. It may not be out of place to review here, briefly, our present knowledge of the rôle of opsonins in the blood.

As you are all probably aware, Wright and Douglas of London, discovered several years ago that the serum from normal and immune blood contains substances, which they called opsonins, from "opsono," "I prepare the food for." These opsonins, by their actions on bacteria, render them more easily digestible by the polymorphonuclear leucocytes of the blood. They showed beyond question that this process depends upon the action of serum upon the bacteria. Bacteria suspended in salt solution resist this process of phagocytosis by washed leucocytes, while bacteria previously mixed with serum and then washed, that is, freed from serum, are quickly taken up and digested by washed leucocytes. Treated in this manner, bacteria are said to be opsonified, while there is no *apparent* change in form, staining reaction, or function. The Opsonic Index means the relative amount of opsonins in the serum of a given patient, compared with the amount in the serum of a normal standard. To find the opsonic index of a patient in regard to a given bacterium, the average number of bacteria taken up per leucocyte under the influence of the patient's serum is divided by the average number taken up per leucocyte under the influence of a standard normal serum under similar conditions. In this way the opsonic indices of all the usual pathogenic bacteria can be found, and the results compared with the clinical and bacteriological findings. The opsonic index can not be taken as a complete index of the antibacterial power of the individual under all circumstances, because opsonins are only part, though probably the most important, of the protective substances formed in the blood. It must be remembered, also that the opsonic index alone, without clinical and bacteriological corroboration, cannot be taken as a sure diagnosis of infection, because the index may be high or low according to whether the patient is improving or not.

It is now necessary to consider how we can increase the amount of opsonins in the blood. This has been shown by innumerable tests to be possible by the injection into the blood of suitable bacteria in proper amounts after sterilization. This is true in the normal individual, as well as in chronic infections due to the corresponding bacterium. Cultures of the organism causing the infection are grown, usually on agar slants, or on blood serum, for about 24 hours. The growth is then separated from the medium and churned up in the tube with 5 to 10 c. c. of .85% Na Cl solution. The growth in several tubes are emulsified in this manner, and are then sterilized in sealed tubes at 60° C. for about one hour. The suspension is standardized by counting the number of bacteria per cubic millimeter of fluid. After the bacteria have been killed the tubes are unsealed, and cultures are taken and incubated to make sure that the bacteria are dead. When the sterility of the emulsions is proved it is diluted to the proper standard with .85% Na Cl solution containing .25% carbolic acid. The "vaccine" is then ready for inoculation. Autogenous vaccines i. e., vaccines made with bacteria obtained from the patient's own lesions, are not always necessary, but are sometimes desirable, as in affections due to the *Streptococcus* and *B. Coli. Communis*.

On the inoculation of any vaccine there is at first a period of diminished resistance, called the "negative phase," normally from 24 to 48 hours. This is followed by a period of increased resistance, owing to the increase in the protective elements of the blood, called the "positive phase." After several days there is again a gradual decline in resistance, the so-called "secondary negative phase." It will therefore be seen that the next inoculation should be given only during the positive phase, in order that there may be an accumulation of the protective substance of the blood.

Hektoen summarizes as follows the consideration for inoculations:

First, the power of the injected bacterial substances to stimulate the formation of opsonins and other specific antibodies.

Second, the belief that increased formation of such substances may hasten healing of the corresponding infections.

Third, the apparent inability of the body under certain conditions of natural infection to produce such substances without special stimulations.

The essential prerequisites for therapeutic inoculations are:

First, correct etiologic diagnosis.

Second, sterilized, pure culture of the bacterium causing the infection in each disease, or sterile products of such bacteria.

Third, the injection of proper doses at proper intervals so as not to necessarily lower the antibacterial power, or cause other unfavorable disturbances.

The routine of treatment is as follows: At the first visit of the patient a sample of blood is taken in a small tube for the determination of the opsonic indices of all the pathogenic bacteria that are commonly found. A culture is then taken from the gums around the affected teeth, care being taken to press toward the surface any trace of pus which may be present in the gums around the teeth. From a comparison of the bacteriological findings and the corresponding opsonic indices, a fair indication of the patient's normal resistance to the bacteria present may be obtained. An autogenous vaccine may be made from the bacteria and used in the treatment, or, if thought best for one reason or another, a stock vaccine made from several virulent strains of the same bacteria may be used.

It is my custom to give the injections in the upper arm, having previously sterilized the skin with alcohol. After the injection the needle-puncture is sealed with collodion to prevent the possibility of infection from without. During the course of several thousand injections there has never developed an abscess at the site of the puncture. The dose varies according to the vaccine used. The standard minimum dose of Staphylococci is 250 million, while that of Pneumococci is 50 million. Our vaccines are standardized at Staph. $\frac{1}{2}$ c. c.=500 million, Pneumococci, $\frac{1}{2}$ c. c.=100 million. These are mentioned as being the two most common bacteria found in inflammatory conditions in the gums. The injections are repeated every three to five days according to the opsonic index, the local and constitutional reactions, and the experience of the doctor.

Bearing this necessarily brief description of opsonic principles in mind, we will now return to a consideration of their application to the disease. First, however, let me state that a complete history of every case is obtained to see what conditions there may be present which may have a bearing on the disease, such as past and present sicknesses and diatheses, and the mode of life. The urine is also carefully examined for signs of renal diseases and diabetes.

An analysis of the author's seventeen cases shows that in six cases the culture revealed a practically pure growth of Pneumococci. In all the others the growth was principally of Pneumococci with a small admixture of Staphylococci. As compared with cultures taken from normal mouths, and in connection with the opsonic indices, this showing is most significant. We all know that the mouth contains many bacteria, normally, but cultures never show growths as were found in this series. We will now examine the opsonic indices in these cases. In one case the index to Pneumo. was 48% of normal. Seven varied from 52 to 59%. Two from 61 to 65%. Four from 70 to 78%. One at 80%. One at 95%, and one at 120%. The indices for Staphylococci varied from 36% to 145%, all but four being below 87%. It will thus be seen that the presence of these bacteria in the gums was corroborated by the corresponding opsonic indices, showing that the blood of these patients was deficient in the normal protective substances. The occasional high indices are accounted for by the fact that the blood was temporarily, at least, manufacturing more protective substances than usual. In all cases of doubt a series of indices, taken at regular intervals, will show whether the high level is being maintained.

In but one case was there any sign of renal disease or diabetes. Two patients had an indefinite previous history of rheumatic tendency. Two others had constipation and indigestion to a slight degree. In four there was a precedent family history of Pyorrhoea. Every case had receding of the gums. Eleven cases showed active pus which could be expressed on pressure around the teeth. The duration of the disease varied from three to forty years. The presence of the Spirochetæ Refringens was not demonstrated in any case. Except as noted above the patients were all in good general physical condition. At the time

of examination all the cases showed red and tender gums about the affected teeth, and all but two bled easily. Four patients had no loose teeth at the time, but two of these four had lost teeth previously from the disease. All cases were referred to me by careful and capable dentists, and all were having thorough dental treatment. One patient had had, in addition, I K I treatment locally during the previous year, without apparent benefit. Whenever it was necessary, as in constipation, rheumatism, or other abnormal condition, appropriate remedies were given.

The length of time of opsonic treatment varied from four weeks to nine months, with remissions from time to time. The shortest case was a lady, 60 years old, March 21, 1908. Her gums were red, inflamed, and bled easily. There was recession of the gums but no loosening of the teeth, though she had previously lost one. A culture showed a pure growth of Pneumococci while her opsonic indices to Pneumo. varied from 67 to 81% of the normal. Injections of an autogenous vaccine of Pneumococci, at intervals of three and four days, increasing steadily from 50 to 240 million, were given for four weeks. At the end of this time the gums were of normal appearance, there was no tenderness or bleeding, and there has been no recurrence for the past year. The longest case noted is of an entirely different character. February 26, 1908, E. G., 65 years old, had had Pyorrhoea for 40 years. Had lost all her upper teeth, all the lower molars, and two bicuspid. The gums around the lower teeth, which were all loose, were spongy and ulcerated, and pus could be seen around all the teeth. Pain on eating was so great that she had made no attempt to chew meat for many months. Cultures from the pus showed a growth of Staphylococci and Pneumococci, and the corresponding opsonic indices were 36% and 58%. There was a definite history of an acute lighting-up of the disease one year previously, following an attack of grip. It seems very probable that in this case the infection secured a foothold at that time from which it was never dislodged. Autogenous vaccines were made, and injections, varying from 200 to 500 million Staphylococci and 60 to 120 million Pneumococci, were given every three or four days. There was a gradual, though slow, improvement during the first month. The ulcerations began to heal, the odor was less foul, and the tenderness and bleeding were

greatly diminished. During the next month the improvement was more marked, and by the end of the third month, the gums were of normal color and texture. There was no bleeding and the patient could chew with comparative comfort. During this time, however, three very loose teeth, the lower left incisors and canine, which had been held in place by silk from the beginning of treatment, were removed, cleaned, and tied in place again. The right lower canine and first bicuspid, which had been slightly loose, were found to be much more firmly placed than before. The indices taken from time to time remained consistently above normal. For the past nine months there has been no inflammation of the gums, and consequently, no sign of pus. Owing to the fact that some of the teeth have become almost solidly placed, the patient insists on continuing the treatment from time to time, in the hope that all the teeth will become firm. She has been told many times that where the alveolar process has been absorbed there is probably no chance of its regeneration so that the teeth can become very firm. In spite of this she is most hopeful and insists on having the treatment, saying that, at any rate, it makes her feel better. The teeth which were taken out and cleaned are now held in place by a gold brace behind the teeth, and there appears to be a slight adherence of the gums around them.

Ranging in severity between these two examples are many types, some of which yielded readily to treatment, and others which were more resistant. In the cases where there was no loosening of the teeth the beneficial results were more quickly obtained, as may be imagined. In all cases where there was tenderness, inflammation, and bleeding of the gums relief was obtained usually inside of one week. In most cases where pus was present there was considerable resistance to treatment, lasting from a few weeks to four or five months. In a few instances loose teeth became markedly firmer. A brief resumé of cases may be of interest.

February 29, 1909, T. B., 59 years. Treated for past 10 years for Pyorrhoea. Has lost two upper molars. Has several loose teeth at present. General recession of gums, which are tender and bleed easily. Hurts him to chew meat. No pus seen. Treated seven weeks with Staph. and Pneumo. vaccines. At end

of that time gums were in healthy condition. Could chew beef easily and there was no bleeding from use of a brush. Teeth felt firmer but were still slightly loose.

March 5, 1908, E. C., 28 years. Treated for 12 years. Has lost three teeth. Receding of gums. Several loose teeth with pus around them. Is wearing a brace. Gums red, swollen, and painful most of time. Does not attempt to chew meat. Treated three months with Staph. and Pneumo. vaccines with marked benefit. When she stopped treatment, in order to go away for the summer, there was no inflammation of the gums evident. There was occasionally a trace of pus seen. Was told to return for treatment in the autumn if she still had trouble, but did not appear. In this case there was no evident tightening of the teeth while she was under treatment.

October 20, 1908, A. C., 47 years. Three years' duration. Two loose teeth at present. Gums slightly inflamed and tender. No pus seen. Bleeds easily on using a brush. Injections of Pneumo. and Staph. vaccines for nine weeks, when she was obliged to leave town. At that time the gums were of normal color and were not tender or bleeding. Teeth felt much less insecure, and she could chew without tenderness.

June 29, 1908, E. F., 46 years. Teeth treated for past 10 years scaling, etc. Several teeth loose for three or four years. Gums red, and infiltrated about loose teeth, tender, and receding. Hurts him to chew. No bleeding. No pus seen. Treated five weeks with autogenous Staph. and Pnuemo. vaccines with marked benefit to gums, but teeth were still loose. Went away for three months' vacation. On his return gums were in fairly good condition. Could bite off the end of a cigar with his incisor and canine teeth, which he could not do before, because of the looseness and pain. Resumed treatment for one month as a prophylaxis. At end of month gums were in healthy condition and the teeth were much firmer. Patient was seen four months later, and the disease had recurred. He promised to return for treatment, but has never appeared.

November 19, 1908, P. F., 49 years. Disease of 10 years' standing. Frequent scaling of teeth, and local treatment with I K I for past year without benefit. Sent to me by his dentist as

being a particularly hard case to treat. Has lost several teeth. Receding of gums for many years. Gums red and boggy with free pus around four loose teeth. Cannot eat meat because of pain on chewing. Given autogenous vaccines of Staph. and Pneumo. since first of last December, and is still under treatment. By the end of the month the gums were in nearly normal condition, with no redness or tenderness. There has been constant improvement since then. At present the only symptom noticed is a rare trace of pus around one of the lower incisors. The loose teeth have all become markedly firmer, especially the lower incisors.

March 24, 1908, W. G., 60 years. Fifteen years' duration. Has lost eight teeth. Two loose teeth at present. Gums slightly inflamed, but there is no pus present. The loose teeth are very tender and painful on chewing. Given an autogenous vaccine of Pneumo. for five weeks, at the end of which time she discontinued treatment, as she lived at a distance of 75 miles. When she stopped treatment there was no inflammation of the gums, and no tenderness or pain in the teeth on chewing. When heard from recently there was no recurrence since one year ago, and the loose teeth were much firmer.

February 17, 1909, A. H., 64 years. Pyorrhoea for 10 to 12 years. Has lost two teeth recently, and there are four loose teeth at present. Gums bleed easily, and occasionally get red and tender. Some pus around upper molars. Eats no meat because of pain on chewing. Because of looseness and projection of one of upper left molars, teeth do not come together well. Culture shows a pure growth of Pneumo. Was given autogenous vaccines of Pneumo. and Staph. In this, as in several other cases, was given the Staph. vaccine because of a low opsonic index, and for its stimulating effect. Treatment lasted six weeks. At the end of that time there was no redness or tenderness of the gums, and the teeth were not at all painful. No discomfort on eating meat. Feels much stronger and in better general condition. The upper left molar, which was loose and projecting, has gone back into place and is firmer, so that the upper and lower teeth meet better. Treatment is discontinued because patient is going abroad.

October 12, 1908, A. K., 45 years. Duration of three years. Gums receding and, occasionally, are red and tender, and bleeding. No loose teeth, and no pus seen. Treated for past year in

London by scaling, etc. After opsonic treatment for two months her dentist advised stopping for awhile as, in his opinion, the condition was entirely relieved. No recurrence in past six months.

March 29, 1909, C. R., 53 years. Fifteen to twenty years' duration. Has had bleeding for years. Gums get red but only slightly painful. All of lower incisors are loose, and are painful on chewing. Pus present around incisors with pure culture of *Pneumo*. After one week teeth ceased to be painful on chewing. Has been under treatment but two weeks and already notices considerable improvement.

January 25, 1908, S. S., 38 years. Five or six years' duration. Has had receding of gums since beginning, and has lost three teeth during past year. Pus always present as teeth begin to loosen. At present none of the teeth are very loose, but two are just beginning. Gums are red and tender, and there are small ulcerations about the loose teeth. No especial bleeding except when a stiff brush is used. After two weeks' treatment there was much less redness, and practically no tenderness. The teeth also felt firmer. At the end of one month the ulcerations were all healed and the gums were apparently normal. Two weeks later the teeth were quite firm and treatment was stopped. When seen over a year later there had been no sign of recurrence.

March 16, 1908, C. W., 32 years. 'Two years' duration. At intervals of about six months gums become irritated and tender. At present the gums around the two lower middle incisors are dark-red and tender. Also same condition around right upper canine. No loosening of the teeth. Pus present around upper canine, and gives pure culture of *Pneumo*. Under treatment for ten weeks with steady improvement. At end of that time the gums were normal in color, and were not tender. No pus around the tooth. Told to return if there was any further trouble, but has not been heard from.

May 9, 1908, K. W., 50 years. Under treatment for past 14 years, and has lost two teeth. Is under treatment for renal disease. Gums are red, spongy, and tender. There are several loose teeth which are tender and painful. Pus present around first lower right molar. Pure culture of *Pneumo*. Under treatment for seven weeks with autogenous vaccines, with great improvement. When she discontinued, in order to go away for the

summer, her dentist said she had not been so well for years. The gums were normal in color, and were not tender. The teeth were still loose, however. When heard from seven months later the trouble had reappeared but she never returned for treatment.

October 17, 1908, R. W., 50 years. Has had trouble about four years, and has lost five teeth. Gums red, inflamed and tender, and pus is always present about five teeth which are very loose at present. Chewing of food is very painful. Treated about ten weeks with autogenous vaccines of Staph. and Strepto. At the end of treatment, which he stopped because of his business, which took him away from the city, he felt much better locally and generally. The gums were of good color, not tender and the teeth felt much firmer. There was no discomfort on eating, and there had been no pus for two weeks.

Two other cases, not of Pyorrhoea, but of infection through the gums, may also be of interest:

November 28, 1908, D. B., 22 years. Born and brought up in Ireland, where she lived until three or four years ago. Has had hypertrophy of the gums since she was five years old. Gums are always red and tender, and bleed very easily, particularly when eating. On account of the pain she does not chew her food, and is suffering from poor digestion for this reason. Pus is usually present around the upper and lower incisors. Culture shows practically a pure growth of Pneumo. with a few Staph. After a week's treatment with autogenous vaccines there was very little redness and bleeding of the gums, and the appetite was much improved. At the end of a month she stopped treatment as she felt so much better. The gums were of normal color, much shrunk from the former condition, and there had been no bleeding for two weeks. She could chew meat easily, had a splendid appetite, and her general condition was excellent.

H. R., 29 years. Two years previously, August, 1907, had had treatment of left upper canine by a country dentist, who for some reason filled the canal with an arsenical preparation. This was removed later by her regular dentist. One year ago (April, 1908) she developed an abscess in roof of mouth near root of left upper canine. This abscess was incised, and pus containing Staph. and Pneumo. was evacuated. No bare bone felt. Given

autogenous vaccines for three weeks, during which time the abscess healed. One month ago another abscess in same location appeared, and was opened. The tooth was removed and a communication was found between the opening in the roof of the mouth and the socket. Bare bone was felt with a probe. It seemed singular that the channel remained open and discharged pus in spite of opsonic treatment, until, one day two weeks later, a sequestrum $\frac{1}{4}$ in. square and $\frac{1}{8}$ in. thick, was removed from the palate process. The wound then promptly healed.

CONCLUSION.

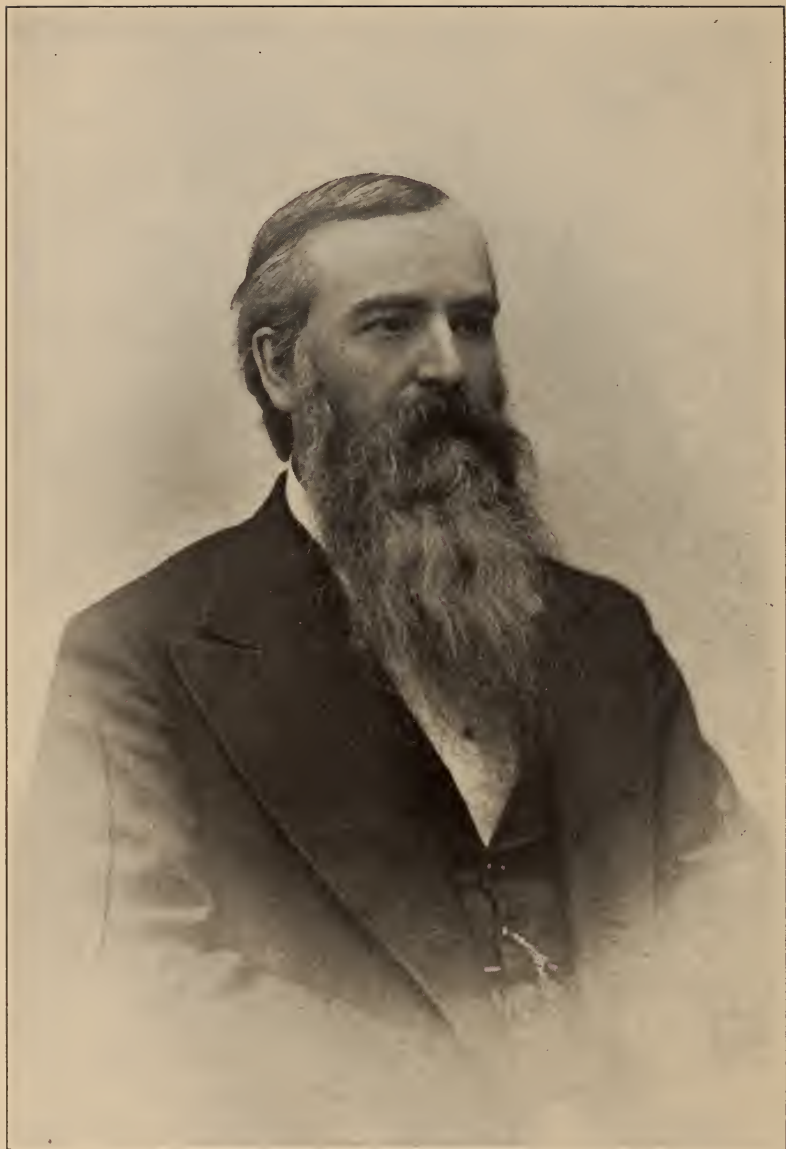
It seems probable that, underlying all the various conditions which contribute to the onset and progress of Pyorrhoea, there is a deficiency in the normal protective substance in the blood. This is shown by the almost invariably low opsonic indices to the same bacteria which are found to be active in the gums. We have found that, whatever conditions may be present, as soon as the blood is stimulated to form new protective substances there is an immediate improvement in the patient's condition, both locally and generally. It must be distinctly understood, and this point cannot be too strongly emphasized, that in order to get the best results, the opsonic treatment *must be* combined with careful and thorough dental treatment. The statement is often made that the disease can be held in check, and sometimes cured by dental treatment alone. This is probably true in some cases, but most of the patients seen by the writer were sent by good dentists as cases which they were unable to benefit. As a rule the opsonic treatment is slow, and it may take several months before the gums are free from pus and in a healthy condition. Especially in these cases is it necessary to assist nature by removing calcareous deposits which act as a constant irritation, fastening loose teeth for the same reason, and correcting malpositions. Wherever it is found that some constitutional condition is complicating the case, this must be relieved as far as possible, as in any other disease.

The writer is often asked whether teeth that are already loose can become firmly placed again. Patients are told that the cause of the teeth becoming loose is the absorption of the alveolar processes about the sockets, and that in all probability

opsonic treatment will not cause a regeneration of the bony structure. In the face of this statement there is absolutely no doubt that in several cases the teeth have become firmer. Another question often asked is as to the length of time the improvement will continue after treatment has stopped. It is too soon to answer that question satisfactorily, owing to the shortness of time which has elapsed since this method of treatment was begun. Two cases which have had no treatment for nearly fourteen months have had no recurrence. It is my procedure to tell patients that when they are relieved once, it is easy reasoning from results obtained in opsonic treatment of other diseases, to hold the disease in check on the first appearance of further symptoms. It is unfortunate that many of the patients have had the trouble so long and have suffered so much from it, that, unless they obtain immediate results, and are promised future immunity, they easily become discouraged.

Judging from the results so far obtained in all stages and degrees of Pyorrhoea, it is apparent that we now have at our disposal a method of treatment, which, though often slow, is constant in its good results, especially when combined with thorough dental treatment.

The writer is indebted to Dr. L. S. Medalia, of Tufts College Medical School, for preparations of vaccines and determination of the opsonic indices.



DR. JOHN A. FOLLETT

BANQUET TO JOHN A. FOLLETT.

On Saturday, March 6th, the large banquet room at Young's Hotel was filled to overflowing by graduates of the old Boston Dental College, who came from all parts of New England to do honor to former Dean and Professor Dr. J. A. Follett, on the occasion of his seventy-fifth anniversary.

It was a delightful occasion, and a memorable one for all who were present.

An atmosphere of good feeling seemed to pervade the room, and this found spontaneous expression in the remarks of the speakers of the evening.

It was a great pleasure to see Professor Follett again, and to hear him speak, with all the vigor of youth, and the added richness which years brings to a life well lived.

He was presented with a purse of gold, as a token of appreciation of his long and valued services.

Among the speakers were Dr. R. R. Andrews, Dr. E. W. Branigan, Dr. J. F. Daly, Dr. Levi Parker, Dr. J. L. Bellefleur, Dr. Homer Emerson, Dr. F. S. Fogg, Prof. William White and others.

Boston, March 7th, 1909.

THE NEW YORK INSTITUTE OF STOMATOLOGY

A regular meeting of the Institute was held Tuesday evening, April 6, 1909, at the Academy of Medicine, No. 17 West Forty-third Street, New York City.

The President, Dr. Kimball, occupied the chair, and called the meeting to order.

The minutes of the last meeting were read and approved.

COMMUNICATIONS ON THEORY AND PRACTICE.

Dr. J. Morgan Howe—I have brought some preserved specimens of teeth with the progressive marks of decay on them—a duplicate of what was prepared by Dr. Lawrence Baker for the Dental Hygiene Council of Massachusetts. It is an exhibition of the progress of decay, from its inception to the later stages.

The President—This exhibit was seen by some of us at the Boston meeting, and it is extremely interesting. We are indebted to Dr. Howe for bringing this before us.

The subject for the evening will now be taken up—"A Study of the Sulphocyanates in Saliva, and some of the Literature." I have the pleasure of introducing our beloved friend and member, Dr. J. Morgan Howe.

(For Dr. Howe's paper see page 183.)

DISCUSSION OF DR. HOWE'S PAPER.

Mr. H. Carlton Smith, of Harvard University—I want to express my appreciation of the kindness of your executive committee in inviting me to discuss this paper of Dr. Howe's. On the purely scientific side of Dental investigation, there is no subject more worthy of our interest than the saliva, and no one constituent of this fluid has received more attention than the sulfocyanates, perhaps because the salts are peculiar to the saliva, and occur in the blood and urine only incidentally.

Dr. Howe has given us a most valuable resume of this subject. As I have told him I see little chance for excitement from my discussion, as I can only say amen to all he has told us, and I would like to put one big one at the end of his first paragraph in which he says that he prefers the term sulfocyanate rather than sufocyanide. It is an accepted rule of chemical nomenclature that the

termination "ide" or "id" shall be applied to binary compounds, and by no stretch of the imagination can we consider a compound of four elements K. C. N. S. as belonging to this class. More than this the sulphur atom simply replaces O in KCNO, which can be only potassium cyanate, never "cyanide," as this is the name of a wholly different substance.

I like also the term used by the essayist "average percentages" or "average amounts" much better than "Normal" percentages or amounts. "Average" signifies something tangible, and the average findings in cases of disease or immunity from disease gives us a concrete starting point from which to reason which the term Normal will not do for some time to come.

If I understand the references to Dr. Fenwick's work, we gather from it that a diseased condition of any sort tending to poor metabolism or insufficient cell activity, results in diminished sulfocyanates, and that in conditions of health accompanied by full diet, normal cell activity, and complete oxidations the sulfocyanates are increased.

Now when Dr. Low tells us that a high amount of sulfocyanates means good teeth, and a low amount means poor teeth, is he not making a specific application of Dr. Fenwick's general conclusions, possibly without making sufficient allowances for the modifications produced by other constituents? Dr. Howe has remarked that it does not seem clear to him "that the amount of other constituents and their relation to the sulfocyanates may not have as much significance and importance."

In this connection let us consider Michael's Synoptic table No. IX.

The table reads "Correlation between the presence of Sulfocyanids of ammonia and Dental Caries." Turning back two pages we find a reference to this table as showing the proportion of acid sulfocyanids and of ammonia in mixed saliva, so it is only necessary to read sulfocyanids and ammonia to have the article consistent.

Prof. Micheals seems to consider the relative amounts of the ammonium compounds and the sulfocyanates of greater importance than absolute quantities of either. If the acid sulfocyanids be present in equal quantities with ammonia, the intensity of the coloration by means of reagents is nearly the same, indicating a healthy state and immunity to dental caries.

If the sulfocyanid exceeds the ammonia the hyperacid condition is indicated. If the ammonia is in greater quantity than the sulfocyanid it is a sign of hypo-acidity.

The significance of these varying proportions of ammonia salts and sulfocyanates we need not dispute, but we can hardly pass Dr. Michaels' statement that "Ammonia must be considered as a nitrogenous element completely oxidized and of a higher order than urea." This is misleading to say the least, for, as a matter of fact, the production of ammonia is not at all a matter of oxidation.

Hawks' *Physiological Chemistry*, 1907, page 270, explains that urea is a more highly oxidized form of Nitrogen than ammonia, and ammonium salts are present in consequence of a lack of oxidation, exactly the opposite of Dr. Michaels' statement. Long's text book of *Physiological chemistry*, page 361. "In any pathological increase of mineral or other acids, if there is not enough fixed alkali in the blood to combine with them, ammonia is split off from the protein derivatives in quantity sufficient to complete the neutralization." Here is a theory for the occurrence of ammonium salts, reasonable, and not antagonistic to recognized chemical principals.

Dr. Michaels, however, has set us all to work, and for that he deserves our thanks.

Dr. Howe has referred to the lack of standards and of uniform methods. Permit me to quote from a paper I expect to give to the American Academy of Dental Science to-morrow night.

Without doubt the various investigators who have been at work during the last five years would have accomplished much more if they had definite rules of procedure, but this was impossible at first. It is not impossible now. And I hoped that some action might be taken by the National Association that would result in a congress of workers or committees large enough to fairly represent the whole country, perhaps one member from each dental college and dental society, which should formulate methods and fix standards. I doubt very much if such work could be acceptably done by a small or local committee.

The agricultural chemists get together once a year and formulate methods of analysis. The food chemists, and the iron and steel chemists also adopt uniform methods, and the lack of

uniformity in our investigations of saliva I believe to be a serious hinderance to progress; but it is obviously unwise to suspend all operations because of this lack.

In my own work I have adopted and discarded a variety of methods for the quantitative determination of both sulfocyanates and ammonias, and have become thoroughly convinced that the following are statements of fact.

1st. That we need both qualitative and quantitative tests for these substances.

2d. The qualitative and quantitative tests can not be the same, as the amount of sample often presented will not admit of more than the use of a drop or two for each test. In such a case the qualitative test only could be applied.

3. The use of the "5 drop test," suggested by Prof. Michaels, is admirably adapted to qualitative work. The sulfocyanide test being the color produced by one large drop of saliva and a drop of ferric chloride solution. The ammonia test is the color of a drop of saliva with a drop of Nessler's solution.

4th. Accurate quantitative work by means of colorimetric processes is impossible if precipitates are produced which carry down the color compound, and this liable to happen in either the qualitative tests above mentioned.

For a quantitative sulphocyanate test, since the tissue paper method of which Dr. Howe spoke, I have been using a modification of his own test which I think is in some respects better than the test which I first gave him. This consists of mixing thoroughly a few c. c. of the saliva to be tested with an equal volume of strong alcohol, filtering carefully, and to the perfectly clear filtrate adding one drop of 5 per cent. ferric chloride for each c. c. of the mixture used. The object of this process being not only to produce a solution which will be free from any precipitate when the ferric chloride is added, but also to get rid of precipitated albuminous substances in the saliva. I use about 4 c. c. of filtered saliva, and alcohol with 4 drops of ferric chloride, and compare the color in a one dram homeopathic vial filled to the depth of one inch, with a set of eight standards, made with the same vial. The vial must be flat bottomed, as the color is observed through the length of the column of liquid (one inch).

The results are very accurate. The ammonium test is a little more trouble, because Nessler's solution is much more prone to give precipitates.

A little fresh bleaching powder, about 2 c. c. of water and 1 c. c. of saliva shaken together, then an aqueous solution of phenol added to 5 c. mark shaken and filtered into a cell of this sort (sample), give with fair accuracy the amount of ammonium salts present. Both tests may be made in five minutes' time if the materials are at hand, but how about the record? I believe the arbitrary use of figures 1 to 8 as Dr. Howe and others are doing is the most valuable method. 1-50 of 1 per cent. KCyS and .0071 of 1 per cent. NH_3 are cumbersome, and, worse than that, discouraging figures for comparison to a man who would like to do work of this nature if he could feel himself equal to it. Simplicity of manipulation and of calculation is of the utmost importance. Ammonia 3 and sulfocyanate 4 is an easy and practical method of stating a similar result. Then actual amounts represented are bound to differ widely, just as they do in Michael's test with Nessler's solution and Ferric chloride, as they must because of the unavoidable difference in delicacy of tests for different substances.

Whatever we do let us work carefully, accurately, and honestly, even if slowly, for work that has to be undone is a source of injury. Conclusion at which we jump from too great a distance are often erroneous and are detrimental to the standing of the profession to which we belong. It is true of my profession, and of yours, or of any.

I was glad to receive last Friday Dr. Howe's new analysis blank. It is neat, allows of two or three records for one patient, and mentions all of the substances worth looking for at present with perhaps the exception of the oxidizing enzymes, acetone, and the microscopical story.

Dr. Talbot used a very similar method in his report of the acidity of urine and saliva. He calls thirty degrees about the normal acidity of urine. His degree represents one tenth of a c c of normal alkali, used to titrate 10 c c of the sample. If he takes 3 c c of normal alkali to counteract the acidity of 10 c c of urine, he will have the degrees of acidity.

In regard to the number of tests it is wise for the dentist to make in routine examinations.

I received last week a new record of analysis from Dr. Howe, in which he uses the following: The reaction, the ammonia, the sulphocyanate, the nitrates, the chlorides, nucein, albumen, and specific gravity. If we take these with the addition possibly of acetone and the micro-polariscopic pictures, it would, I believe, give us a sufficient basis for comparisons, and throw considerable light on this subject of salivary analysis.

I thank you for your attention.

Dr. Joseph Head—The trouble is that we have no technique we can reply upon. An analysis of saliva may show us saliva alkaline to one agent, neutral to another, and acid to another. In one instance the acid is the predominant feature, in another the acid and alkali were neutralized, and in another the alkali was predominant. What we principally want to find out is what ingredient of the saliva is most active on the enamel. There may be great systematic questions involved; but that really is the vital question to us, and we do not care whether a saliva turns an agent alkaline. If there is something in it which attacks the enamel, that is the important point for us.

Those color tests with colored paper are most interesting; but honestly, I do not believe them accurate. Those arbitrary colors are fine to fool people with, but I do not think they have any scientific basis, and we must get down to a real standard. If those figures are true they are very interesting; but I have seen thousands of other tables equally interesting, that afterward proved entirely wrong. I do think, my friend, Dr. Ferris is quite right in his statement that he hopes to get his technique so it can be understood by ordinary dentists.

For some years I have been working on the acidity of saliva. I did not go to water solutions first, but I used saliva, and that is the last thing we seem to think of. We should make color tests with saliva solutions. I wonder how many of these tests were made with saliva solutions. Did Dr. Howe really take a solution of saliva and put a known quantity of sulphocyanate in that saliva, not in water? Did he take a certain quantity of saliva—being the lowest color test, and add the proper quantity of sulphocyanate to see if it would rise to the next color?

Dr. Leavitt—What would be the use of doing that, if there was an unknown quantity in it already?

Dr. Head—At least it would be with that factor of error rather than an unknown factor.

Dr. Howe—Dr. Head seems not to understand the purpose of showing those colors.

Dr. Head—As I understand it, you judge from the intensity of color the supposed amount of sulphocyanate in that particular saliva. Am I wrong?

Dr. Howe—You are right so far, but wrong in the statement that they are meant to fool people with. That the color reaction produced in an aqueous solution of known content compared with a similar color produced in the same way in a specimen of a physiological secretion, may be an indication, approximately, of the unknown content in the secretion so tested seems to me a reasonable and scientific premise, notwithstanding its failure to meet with the doctors' approval.

Dr. Head—But when you have the mucus and the saliva, you will have an entirely different condition from distilled water. I was once trying some tests, as to the relative speed with which a thin film in cement would dissolve in comparison with a thick film. Every water solution I used up to 1 part in 40,000 in lactic acid dissolved the tooth quicker than the cement. When I used my saliva solutions I found a very different effect. I found that 1 part of lactic acid to 1,000 of water, would dissolve tooth enamel inside of fifteen minutes, so as to make a white coating. Yet 1 part of lactic acid to 1,000 parts of ordinary saliva, although it will turn litmus blood red, and had a strong acid taste, will not cut enamel. There is something in saliva that has an inhibitory action and restrains the action of acids in decalcifying tooth enamel.

Dr. H. C. Ferris—I appreciate greatly Dr. Howe's scientific effort and the tremendous amount of work entailed. I have done the same class of work with the same kind of color standards, as Prof. Smith knows, and was dissatisfied with this fact, that the colors in my papers would vary. I put papers in drawers and in a glass bottle, taking samples from the same color and putting them aside for two weeks, and then comparing them, and found

the colors varied materially. I tried to get something more definite, and devised a scale for sulphocyanate estimation, using as a basis sulphocyanate of ammonia in preference to the potassium, taking a definite standard solution of 1 in 2,000.

I wanted to show you the reaction in this colorimeter scale, but find that I have brought the wrong reagents. Take these tubes, A and B, and place in the former 1 c. c. of specimen to be examined, and in the latter place 1 c. c. of 1 in 2,000 sulphocyanate of ammonia. Then add two drops of 5 per cent. Ferric Chloride solution to each tube. The color struck in tube B will be darker than struck in tube A; by reducing that in tube B with aqua distille you will finally match the color in tube A, and may read off from the scale the amount of sulphocyanates in thousands.

There is always a chance for error with any instrument. This seems the most practical and accurate method of quantitative analysis that I have been able to find.

The presence of other chemicals in the specimen would produce a certain amount of error, but I believe the system so simple that if that error exists at a later date, we may make a correction in the study of the other quantities, using the same scale with other bases as our foundation of work. This same scale I have used for ammonia, and found a precipitate as Dr. Smith mentioned. For ammonia I used Nessler's reagent and ammonia chloride, 1 in 2,000, as the basis of procedure. I get a precipitation, but allow that to take place before reading my shade. If one can match shades at all, they can get a quantitative analysis of the specimen.

I believe that it is necessary for us to first establish our laboratory technique before undertaking the pathological end of the subject. The Committee of Scientific Research of the National Dental Association have established a laboratory technique which is familiar to most of you, and is quite simple. There is no doubt that we have other reactions than ammonia with Nessler's reagent. We put them down in our technique as organic matter.

With Prof. Smith's permission, I will endeavor to explain an instrument devised by him for the quantitative analysis of ammonia. It appears to be a very accurate instrument, but the technique is painstaking.

The instrument is composed of two glass disks. In the

center of one a four millimeter cell is cemented, the under surface of the other is painted in colors of varying shades of blue, around a transparent center. To a definite quantity of saliva in one tube a definite quantity of bleaching powder is added together with aqua. A chemical action takes place which Prof. Smith will probably explain to us later. After the product has been filtered the filtrate is placed in the cell, and the cover glass on top of it, and the shade that it matches on the circle will indicate the quantity of ammonia present in the specimen.

I have compared Prof. Smith's method with my colorimeter scale, and find a variation of 2,000 in an estimation of 37,000. We must eliminate the organic matter if we want a positive reading in quantitative analysis.

I want to get back to the Doctor's paper, because he has brought out many valuable points from a pathological standpoint which we should not overlook in the discussion.

I want to throw out this thought: Can it not be that the sulphocyanate is a product of the salivary gland? It is acknowledged by all the latest writers, and I have read three books not yet in print on this subject, that the salivary gland is now considered to produce through its own cell action, definite chemical properties.

The theory that products are supposed to enter the saliva from the blood serum, and that the salivary gland was merely a filter for it, is not now in favor. The recent thought is that the salivary gland performs its own function as other organs in the process of digestion. It is my opinion, from my clinical experience, which is really of little value, that the relative condition existing between the sulphocyanate and the ammonia or organic matter—I include both—is a state which develops or retards the bacteriological growth in the saliva. I believe the presence of the sulphocyanate in its proper relation to the free ammonia or organic matter present determines the growth of the bacteria.

I wish to thank Dr. Howe again for a very interesting paper, and his great contribution to our work.

Will Prof. Smith give us the chemistry of the point I mentioned.

Mr. Smith—I do not know whether I can, as I only worked this test out within a few weeks. The color is constant, if the

ferric perchloride is fresh. I thank Dr. Ferris for his good opinion of the test and I feel that his test for sulphocyanate is a little bit better than Dr. Howe's or my own. The idea of the papers fading or changing color I had suggested to me a long time ago; but Dr. Howe's notion of taking a standard manufacture, and a standard number, obviates that to a degree; but even then there is a possibility of the colors fading, and I have used oil paints. My objection to Dr. Ferris' ammonia test is mainly in the unreliability of Nessler's solution. I have used it for fifteen years in all sorts of work, and once in a while—in fact, altogether too frequently—I will find a solution which is apparently made exactly as we always make it, but it does not work or give the degree or amount of coloration that another lot of reagent will. The older it is, the better it seems to be. The amount of precipitate produced has a marked effect on the delicacy or sensitiveness of the re-agent. Thus it seemed to me rather an unreliable agent to ask dentists in all parts of the country to use, not knowing who would be asked to make it. His sulphocyanate gauze with the white background constitutes a valuable test, perhaps the most valuable we have had so far.

In regard to the statement Dr. Ferris just made about the salivary glands, if we read Bunge's *Physiological Chemistry* (1902 edition) we find an account of experiments on dogs, where all the salivary ducts were closed, and it was found that the sulphocyanates absolutely disappear from the urine and the blood, whereas as soon as these ducts were allowed to discharge into the saliva, and the saliva was flowing into the stomach, the sulphocyanate reappeared in the urine and the blood, showing as conclusively as any one set of experiments can that the sulphocyanates are a product of the salivary glands, and appear incidently only in the other body fluids.

Dr. Ferris—In reference to the Nessler re-agent, we are cognizant of that, and have established a set of chemicals to be bought from Eimer and Amend, with a request that those who take up these tests purchase their agents from the same chemical house, that there may be no question of this difficulty.

Dr. Howe—It is sufficiently gratifying to have excited enough interest in the subject to have it discussed as it has been. I think, however, that discussion and criticism should be as defi-

nite as the statements at which they are directed. The matter of a large or small content of sulphocyanate in saliva having a constant relation to dental lesions must, I think, be decided by further investigation. The method of estimating the amount of the constituent is fairly open to proper criticism, and I welcome it. If it can be shown, or even plausibly asserted, that the re-agent, ferric chloride, acts upon any other constituent of the saliva so as to modify the color reaction, with a difference between that, and the reaction produced in a solution of the known content of sulphocyanate in water, then there would be some reasonableness in questioning the value of such means of estimating the amount of the constituent in saliva. But for any one to state merely that they do not understand it, and that they do not believe it, seems to me of no consequence whatever in the consideration of a scientific question such as this. I hope the result of the attention given to it may be the establishment of some facts by further scientific research, and the correction of any errors into which I have fallen. I cannot regard anything on record in relation to this subject as settled.

Dr. Head—The question is not for any one to show whether it acts differently with the saliva. The burden of proof lies with the essayist to prove that it does not. Take No. 1, for instance, and add one part to 100,000 of a dram of sulphocyanate, and get just that color, as equalled to No. 2, and follow that right along—there is a simple test. Do it.

Dr. Howe—The distinguished critic can hardly expect to direct how others shall conduct their studies. I hope Dr. Head will present in actual experiment and research what he has in his mind, in order to show what he thinks is superior.

Dr. Head—That is why we come to a meeting. A question of technique is always open to criticism. I understood that these tests were compared with water and saliva. I think myself, that, having done that, it is a valuable thing; but it is well known among dyers that it is impossible to get the same color absolutely, and to say you have a color of a paper that may vary according to an infinitesimal amount of material in the water, or in the dying fluid, or that may vary according to the rapidity with which it would dry, that would make

for me a very unsatisfactory color standard. While it is valuable when we have nothing better, I do not think it should be taken too seriously.

The President—Dr. Howe, as I understand it, has been working to show certain facts of the saliva, a knowledge of which is valuable to us, viz., that the relation of the sulphocyanates to decay, is not what it has been claimed to be; or that the presence of sulphocyanates bears no definite relation to immunity or non-immunity to decay.

Dr. Wheeler moved a vote of thanks to Prof. Smith and to Dr. Head for coming to discuss the paper. The motion was carried.

Adjourned.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

A regular meeting of the Institute was held Tuesday evening, May 4th, 1909, at the Academy of Medicine, No. 17 West 43rd street, New York City.

The President, Dr. Kimball, occupied the chair.

The Secretary read the minutes of the last meeting, which were approved.

The paper of the evening, entitled: "The Opsonic Treatment of Riggs' Disease," was read by Dr. Theodore Chapin Beebe, Jr., of Boston, Mass.*

DISCUSSION OF DR. BEEBE'S PAPER.

Dr. William R. Williams—Dr. Beebe has adequately presented the rationale of opsonic treatment of pyorrhœa, has explained the technique and has emphasized the need of precaution in sterilizing the vaccine, lest one inadvertently inject living organisms into the patient.

There is nothing to add on these points and in my discussion I shall limit my remarks to a report of my experience with this treatment. My first knowledge of the subject was gained from an article by Goadby in *The Lance*, but Dr. Merritt, in a number of conversations last spring, aroused my more active interest. My first attempt at treatment, however, was made last summer.

To-night I wish to report the results in two or three cases.

Case 1. A woman, sent by Dr. Merritt, with a very refractory case of several years' duration. She lived in a suburb and could come to the city only on Saturdays. Between October 24th, 1908, and February 2nd, 1909, she received eleven injections of an autogenous streptococcus vaccine. After the second injection there was much less pain and less sensitiveness to heat and cold. After the third injection these painful symptoms had practically gone, for the first time in several years, and this condition of her teeth persisted throughout the rest of the treatment. I have not seen her since February 2nd, but inasmuch as she was very enthusiastic over the results and promised to return at the

(*For Dr. Beebe's paper, see page 200.)

first sign of a recurrence of the symptoms, I infer that she has remained well.

Case 2. This patient was seen by some of those present in Dr. Merritt's office this afternoon. She also presented a refractory case. Pus was oozing from several tooth sockets, some teeth were loose; mastication, heat and cold caused sharp pain. She received eleven injections at intervals of not less than one week. The first three were of a vaccine from another patient, the later ones were of an autogenous vaccine. The second week she noticed distinct improvement and after the third injection she said that she was sure the teeth were "better than at any time for years." After a month of treatment the subjective symptoms had disappeared completely, but there was still some discharge of pus. At this time dental treatment was begun by Dr. Merritt. The result of the combined treatment was shown this afternoon. She has teeth and gums that present no subjective or objective symptoms of pyorrhœa. We are waiting with interest to see how long this very happy result will endure. The vaccines she received contained streptococci only.

Case 3. This patient was a man of nearly sixty, who had suffered from pyorrhœa for years. He had from time to time lost some teeth and was waiting with more or less resignation for others to drop out. His teeth were very tender to pressure, very sensitive to heat and cold, pus was discharging abundantly from several sockets, and absorption of the alveolar border was well advanced, half of some roots being bare. He had endured many abscesses and was suffering from an undoubtedly refractory case of Riggs' disease. His treatment was very irregular, as he would not keep appointments. While I was treating him with vaccines for barber's itch I tried to interest him in the vaccine treatment of pyorrhœa by surreptitiously adding some organisms that might help his teeth. The attempt succeeded so well that he subsequently received thirteen injections of autogenous vaccine prepared from a culture from his gums. The intervals were, however, very irregular, varying from four days to as many weeks. After the first few injections he would present himself for treatment only when his teeth pained him or when I chanced to meet him. In spite of this irregularity, his improvement was very striking. The mobility of the teeth varied greatly, at times almost dis-

appearing. He lost the pain on chewing and could take hot or cold drinks with comfort. He could talk out of doors on cold days without annoyance for the first time in years.

His dentist's treatment was even more fitful than was mine, as his disregard of appointments was habitual. In his case we are far from achieving a cure. During the five months of treatment he has lost two teeth that were, however, hopeless from the start, but he has had the experience of comfort in eating and drinking for the first time in a decade.

If I were to mention some points of interest in the discussion of the paper of the evening, I would take up first the varieties of bacteria found in the cultures from the gums. The most common organisms seem to be the pneumococcus, streptococci, and the pyogenic staphylococci. Their chief importance in connection with the treatment is that it makes it necessary to get a vaccine suited to the particular case. This can be accomplished by cultures from the gums.

Another point concerns the relative efficacy of stock and autogenous vaccines. The stock vaccines seem to answer in many cases but this point must be decided by further work. There will probably be many instances where autogenous vaccines must be used.

A third point, and one of much interest, is the need of opsonic determinations. These were made in Dr. Beebe's cases, but not in mine. The process is a laborious one and the alternatives presented to me were either to try the vaccines without opsonic determinations or to forego the treatment altogether. The results seem to justify my attempt to dispense with them. There will doubtless be cases, however, where one will need this additional help, and I shall be very glad to use it when the occasion arises.

The negative phase presents another interesting point. This is shown by the opsonic curve and, when marked, by the symptoms also. Several examples of this can be found in my series of cases.

In the first case mentioned, after the third injection, which consisted of thirty million streptococci, the teeth were sore on the third day. On the fourth day they were better than they had been before the injection. After the ninth injection there was inflammation of a lymph node in the floor of the mouth that resolved

after four or five days. During this time the teeth were perfectly comfortable, but I regard the swelling of the node as an expression of the negative phase.

The second case also had some increase of discomfort after one of the injections that lasted about three days. The third case showed manifestations of this phase on three or four occasions and after the troublesome symptoms subsided he always noticed a marked improvement in his condition.

Dr. Beebe's series of seventeen cases is much larger than mine but we agree in the effect of the vaccines. Other series of cases more extended than ours have been reported in the literature with consonant results. We must admit that the treatment has not as yet been perfected, but it seems to surpass in many cases the older forms of therapy, and to mark a distinct step in advance. A very striking result is the relief of the patient's suffering and discomfort. As to the question of permanent cure, we must suspend judgment. It would seem, however, that early cases and relapses at the beginning could promptly be controlled.

The need of local treatment in conjunction with the vaccines hardly needs discussion. The subjective symptoms may yield without it, but healing is not to be expected in most cases. All would admit the necessity of most careful local treatment.

The various hypotheses as to the primary cause of pyorrhœa, while very interesting, do not seem to me to have much to do with the treatment of the disease by vaccines. Any means that will control the bacterial growth seems to control the disease, whether this is accomplished by cleaning the teeth, by curing a so-called diathesis, or by acting on the protective substances of the body, as with the treatment presented to-night.

In conclusion I can only second Dr. Beebe in his remarks as to the interesting nature of the treatment, in satisfaction with the progress already made and in enthusiastic hopes for its future development.

D. Geo. L. Rice—I became quite interested in Dr. Beebe's work in connection with a patient of mine who was treated by him. A short time afterward I associated myself with Dr. Milliken in the work. As Dr. Milliken is here, I would like to have him report our experience in the treatment of several patients with vaccines.

Dr. Seth M. Milliken—I have a report of two cases that were under treatment for from five to seven weeks last Summer. They were cases of long duration, which were picked out because they were particularly bad, and while they showed subjective improvement at the time, the after-results were of no value. Possibly the treatment was too short, or the doses too small.

The worst case was Mr. H. G., aged about 66, who had had the trouble ten or twelve years. Nearly all his teeth were loose, the gums markedly retracted, and all the lower teeth were wired. He had doses of pneumococcus and streptococcus, working up to about 350 million in thirteen injections. 300 million of the mixed germs was the highest dose. He showed a good deal of improvement. The teeth did not become more firm, but the inflammation subsided, and he had more comfort in eating. He left on July 4th, and I did not hear from him again. I understand from Dr. Rice the teeth are even in worse condition now than before the treatment.

Mrs. De R. had trouble for eighteen years. She showed a pure culture of streptococcus from the only tooth socket which seemed to me to be inflamed. There was no pus, and a culture was made by passing a platinum loop deep down. 100 million to the c c was given, the first dose of half a c c. She said late in the afternoon she had a severe headache and some nausea. The temperature was not taken, but she felt sick. The next morning the temperature was 99°, and in the afternoon 101°. She had pains in the back and legs, and a severe headache which persisted about 36 hours, showing a bad negative phase. Started one week later with 25 million. The highest dose was 225 million of the autogenous cultures of streptococcus. Her mouth felt better, and her teeth looked better; but in the fall Dr. Rice reported no improvement, and after those few injections, the treatment had apparently done no good.

Dr. R. G. Hutchinson, Jr.—I regret very much that I did not hear Dr. Beebe's paper, but I was fortunate enough to see the patient at Dr. Merritt's office this afternoon. This method of treating pyorrhea is interesting, at any rate, in showing what can be done in spite of the continued existence of the focus of infection. The case Dr. Merritt exhibited has certainly made good progress, but I have no hesitation in saying that I believe the

results obtained are due to the surgical treatment received. The case is not completely cured, as Dr. Merritt said, and nothing but thorough surgical treatment will effect a cure.

It seems to me useless to fight this infection so indirectly, when it is accessible and the necrotic tissue can readily be removed by surgical means.

It is my practice to employ nothing but surgical treatment. If we by inoculation raise an army of leucocytes which will fight these bacteria, we are merely masking symptoms. We do not reach the cause, and it is similar to giving large doses of anti-puretics in fevers. It is a difficult thing to keep our patients interested. They get discouraged and tired if they have to undergo prolonged treatment. By thorough surgical treatment, the cure can be accomplished in a short time.

Under stress I have cured cases in two sittings. I do not consider that it is necessary, usually, for a patient to undergo treatment for more than three weeks in order to effect a cure of pyorrhea, involving practically all of the teeth. Usually one or two treatments of each tooth is all that is required, and I do not want to see the profession misled and made to think it is necessary to go about it in such an indirect way. We might just as well try to treat an alveolar abscess by inoculation. In case of alveolar abscess, we must remove the septic contents of the root, sterilize it, remove any pathological tissue which may surround the tooth. By so doing, we effect a cure. And so with the pyorrheal pockets. The pockets that still exist in Dr. Merritt's case show pus, but the case will be cured by surgical treatment.

Dr. S. E. Davenport—I should like first of all to make my personal thanks to the essayist, Dr. Beebe, for his very scholarly paper. To me this is a most interesting subject, and while from my lack of knowledge of it I would naturally range myself on the side taken by my friend Dr. Hutchinson, I feel that, while we have a direct entrance for our fight against this dread disease, we might just as well attack it also with vaccines. From the thoroughness of the study, the result of which has been shown this evening, and the records so carefully kept, there must indeed be a great deal to be said for this method of treating pyorrhea.

I should like to ask Dr. Beebe, when he has an opportunity to close the discussion, whether these cases he reported were treated by this opsonic vaccine method only, or whether some of the improvement which was so marked in many of them came, perhaps, from instrumentation.

Dr. L. C. Leroy—I have listened attentively to the very excellent paper, and my opinion is that opsonic treatment might avail where there is decided infection; but as Dr. Hutchinson said, I believe proper instrumentation is really our remedy. I do not think we will get a cure unless we remove all calcareous deposit—no matter what the systematic treatment might be. It is quite evident from what the essayist has said, that in some instances the disease recurs. It seems to me the purpose of injecting vaccines is to make one immune from this disease, and if it fails in that, it places the patient in the same relationship to the disease as he was before.

I would like to ask whether calculus recurs. Probably it does, as we find recurrence in all conditions; but I would like to ask whether the other infective condition recurs.

In one of the cases mentioned, I think the correct procedure would have been to extract the tooth. I do not believe in the removal of teeth unless the necessity is conclusive, but when they are elongated considerably and there is sharp contact, or their inclination in the socket is such as to form a continuous stress at an angle aside from their long axis—I believe those teeth cannot be cured.

The doctor spoke of one case where a number of alveolar abscesses existed. I am inclined to believe that those abscesses, instead of being alveolar abscesses, were calcic abscesses, frequently not recognized by those who are treating the disease. I have a number of cases in which dentists have been treating calcic abscesses as alveolar abscesses, and one in particular, where a central incisor had been so infected by Rigg's Disease, as we call it, that the tooth was condemned and was about to be extracted. The patient, whose sister has been a patient of mine for some time, was recommended to me, and I recognized that the abscess was of calcic origin. The extreme flow of pus was stopped, and the disease cured in one treatment. That of course was an extreme case, but it shows that frequently calcic abscesses

are not recognized as such. I would almost go as far as Dr. Hutchinson, although I will not make it as positive, and say that the majority of cases can be cured by proper instrumentation.

Dr. J. B. Locherty—I want to express my thanks as a member of this Society to Dr. Beebe for his research in this matter. I believe he is working along the right lines, if the results which he expressed here are any criterion. It does not matter what treatment is adopted, as long as the results are satisfactory. He does not confine himself, as I understand it, to the vaccine treatment, but appreciates the value of instrumentation, which of course is recognized by any established practitioner. As regards the result of his treatment, it is fair to assume that that would be beneficial, just as anti-toxin would be in cases of diphtheria or other infectious diseases. There is a change in the system which makes a person almost immune from it, although there are recurrences.

The few cases which Dr. Beebe has presented to-night give us enough encouragement to go on in that direction. What we are after here, as medical men, is the truth, and truth will prevail in the end.

Dr. Hutchinson—Is it not possible and even probable that this constitutional condition, this low vitality, is very likely the result of absorption and ingestion of toxins which are manufactured in the mouth? I have had many cases with serious systematic conditions sent me by physicians. Toxins and ptomaines being formed right there and swallowed or directly absorbed by the patient cause serious disturbances. In treating opsonically we are treating symptoms; but by the removal of the exciting cause we will raise the constitutional conditions as has been proved many times.

Dr. Howe—I have listened to Dr. Beebe's paper with a great deal of interest and satisfaction, and also the evidence presented by Dr. Williams, which is confirmatory of what Dr. Beebe has offered. I personally want to thank them both for what seems a real contribution to our knowledge of the subject. The discussion seems to emphasize the conflicting views that have existed, as to whether pyorrhea is a local or a systematic disease. I have, of course, observed cases of pyorrhea for many years—both those that I have treated and those that have been treated

by others—and I have deliberately formed an opinion that pyorrhea is caused largely by systematic conditions.

We have cases presenting all the time, in which there are large deposits of salivary calculus in the mouth, without the development of pyorrhea. The removal of the calculus and the cleaning of the necks of the teeth is sufficient to restore the teeth for the time being to a condition of health, although it does not restore the lost tissues where the gum has retracted on account of the irritation from the foreign material.

I welcome the evidence that has been presented to-night very cordially, because it presents a definite means of meeting the systematic condition which I have recognized as being in existence and as related to this disease. I have seen a changed condition of the system so produce an influence on pyorrhea that it became amenable to local treatment which it did not yield to before. A case in point is that of a lady who has been a patient of mine for many years, and who has had a superior cuspid tooth, beside the root of which absorption of the socket and discharge of pus has persisted for over fifteen years, never having much, if any, deposit on the root—but an elongation and a gradual dislocation from its normal position had taken place. During all that time I have at intervals treated the pyorrhea pocket, with some improvement at times, but never with marked success.

During the past two years, the lady has been under treatment for other diseased conditions, which have resulted in a change in the condition of her system. She seems to have been benefited by certain treatment. During that time I have paid very little attention to the treatment of that tooth, but even without local treatment the changed condition of her system has apparently caused it to heal, for it has gotten well, or nearly so, without my treatment. It is restored to comparative firmness, and there is almost no discharge of pus, the pocket is practically healed. Within a month I cut off the crown, because it was so elongated and so disfiguring, and substituted an artificial crown to make it look better; but the root is firm. This has a bearing, I think, on this question of the relation of systematic to local conditions.

The President—Can Dr. Howe report of what the treatment consisted under which the lady improved?

Dr. Howe—No, she has had one or two operations. The point merely is that the condition of her system is changed by surgical and other means, and the improved condition of her health has affected that tooth. The tooth has practically gotten well without my help.

Dr. Provost—This has been a very interesting paper. It takes us back two or three years to the time when Dr. Griswold, from Salt Lake City, was here and gave us an interesting address upon the treatment of pyorrhea by surgical means. The results he secured were excellent, as all will remember. I do not wish to say anything derogatory about the opsonic treatment. I think it is a good field, but I believe, as Dr. Hutchinson does, it is simply treating the symptoms. In contradiction to what Dr. Howe said, I believe it is a local disease. If we extract teeth where pyorrhea exists, we get an absolute cure. If it were a systematic disease, and a tooth should be extracted, we would get manifestation in some other part of the body.

I would like to ask Dr. Beebe whether the surgical work that he speaks of was performed by one man, or by several? If it was done entirely by one man, his thoroughness had a great deal to do with it. If it was done by a number of men, probably the work would not be as thorough in each case.

Dr. H. G. Marshall—I would like to ask those who believe this is a systematic disease, why it is that it will attack one tooth in the mouth and leave all the rest in perfect health? A woman about twenty-five, who has been my patient for some years, has one tooth that is in a very bad condition with Riggs' Disease. I have treated it several times, always effecting what some people might call a cure; but at the end of about six months it would be as bad as before. Once she came with the tooth in trouble about the time this tartar solvent made its appearance, and I thought I would try that. Apparently, following instructions, I got a perfect cure, judging from the appearance of the tooth and the gum. To-day she came to me with an abscess upon it, caused by calculus—the tooth is alive. From my experience, and I have had a great many cases in thirty years, it seems to me like a local trouble.

Dr. Howe—I would like to say that I did not intend to convey the idea that generally a systematic change is all that is needed.

Of course local treatment is required in most all cases. But in the case described, as there was no hard deposit, it was possible for it to heal. The argument presented does not seem to be very forcible, that because disease attacks one tooth at a time, therefore the systemic condition has no influence on it. The patient who has got gout or rheumatism may have it for a period in one joint, and not in all; therefore would we say because it is in the one toe or one knee it is not a systematic disease, or the systematic factor is not important to be considered? I think not.

Dr. Beebe—I would like first to congratulate Dr. Merritt and Dr. Williams on the success of their case, which was shown this afternoon at Dr. Merritt's office. It was most convincing to me. I would like to say one word about the disease being cured by taking out all the teeth. It has been shown that there is a process of chronic inflammation in the blood vessels of the gingivæ, and a constant thickening of the tissue; also that the alveolar process is attacked all around the sockets as well as the tissues of the gums themselves.

None of my cases were treated locally, until some had been under my care a long time, and I thought it better to return them to the dentist for some local treatment. In the first month of the treatment, no case had any local treatment whatever—just plain, opsonic treatment. They had a great relief from all their symptoms—relief of pain immediately—they were able to chew with comfort and brush their teeth with no bleeding of the gums.

I would like to say a few words about those cases of Dr. Milliken's. It seems to me they show very decidedly the advantage of taking opsonic indices. Dr. Williams and I both agree in the giving of small doses. I think the biggest dose Dr. Williams gave was 90 millions, and personally I never went over 85 millions at a dose. I think a series of opsonic indices would have shown a very marked negative phase, and probably in Dr. Milliken's cases, with such heavy doses, the mechanism of immunity was depressed instead of stimulated. I am not criticising his cases at all, but merely offering this as a suggestion.

As to the local symptoms causing a diminution—the opsonic index being lowered a result of the absorption of toxin, I do not quite catch the drift of Dr. Hutchinson's remarks.

Dr. Hutchinson—In hyperæmic conditions, such as accompany pyorrhea, the toxins which are present are readily absorbed and carried through the entire system.

I have had cases referred to me by physicians in which infections of tissues, at a considerable distance from the mouth, undoubtedly had their origin in pyorrhea pockets.

Dr. Beebe—A series of thousands of observations has shown that the absorption of toxins has no direct bearing on the opsonic index. A low opsonic index accompanies a deficiency in the normal protective bacteria.

Dr. Provost—Is the cause of the low opsonic index known then?

Dr. Beebe—Yes; there is a deficiency in the opsonins.

Dr. Provost—Is the cause of the deficiency known?

Dr. Beebe—No. We sometimes find it in patients who have no lesion whatever. We see it frequently in patients of a tuberculosis diathesis who are likely to be infected. It does not mean they have no infection; but where we find a low opsonic index to the same bacteria which are found in the pus, we have something definite to work on.

Dr. H. S. Vaughan—If one of the exciting causes remain, suppuration will recur even though retarded by the increased resistance produced by the vaccines. As I understand it, the point Dr. Hutchinson wished to make was, would not the great amount of suppuration be responsible for the low opsonic index? Would not a condition the same as the negative phase be produced by constant suppuration and lowered resistance, in the same way that an overwhelming infection may cause a hypoleucocytosis.

Dr. Beebe—I do not think so. Replying to Dr. Provost, I would like to say that these cases were referred to me by different dentists, and what local work was done, was done by them. I did nothing in that way, but I said in my paper that I thought the opsonic treatment should be combined with the most thorough dental treatment.

Dr. Provost—Does Dr. Beebe find that the opsonic treatment causes any diminution in the tartar deposits?

We take it the deposits are filled with infection. They are largely of a crystalline formation, and where one crystal is left,

it will cause a re-crystallization around it. Unless the tartar is entirely removed, a cure is impossible under any condition.

Dr. Beebe—I am told by dentists that there is marked improvement in that respect, which I suppose to be due to the fact that the calcium contained in the blood is changed. In other words, I suppose that as a result of opsonic treatment, the blood is thinned out, and the calcium salts do not crystallize out as readily as before, because these dentists have said in every case there has been marked improvement, temporarily, at least. The worst cases were those that did not come back for one reason or another when they were told. Those cases had not received dental treatment at the same time.

Dr. Leroy—Will Dr. Beebe say something about immunity after the injection of the vaccine?

Dr. Beebe—Immunity of the blood is built up by the injection of corresponding bacteria to the infection, whatever it may be, thereby increasing the amount of opsonin in the serum of the blood.

There is one other point I would like to bring out. In one or two cases with rheumatic tendency. I have found that the infection was due to mixed infection of staphylococcus and pneumococcus. I have also had in my regular practice several cases of undoubted rheumatism, where there was no pyorrhea, but where the patient was low in resistance, according to the opsonic indices to the same bacteria—staphylococci, sometimes streptococci, and usually pneumococci.

There is a query in my own mind whether there is any connection between these two conditions—certain forms of rheumatism and certain forms of mouth infection, particularly pyorrhea.

I wish to thank the Institute for the very careful and courteous attention given my paper.

The President—It will perhaps interest Dr. Beebe to know that the point as to the relation between rheumatism and pyorrhea has been made before by careful and dental observers. In the opinion of many there is a direct relation between the two; so we are glad to have the testimony of an independent observer in that direction.

A special vote of thanks was offered Dr. Beebe and Dr. Williams.

Adjourned.

Commonwealth of Massachusetts,

BOARD OF REGISTRATION IN DENTISTRY.

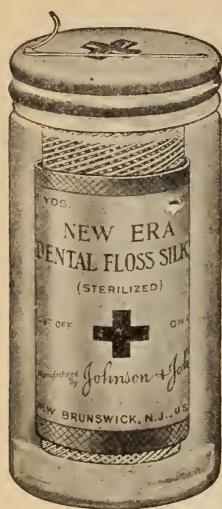
A meeting of the Massachusetts Board of Registration in Dentistry will be held in Boston for the examination of candidates October 27, 28, 29, 1909.

Applications and further information obtained from the Secretary, Dr. G. E. Mitchell, No. 25 Merrimack street, Haverhill, Mass.

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THE JOURNAL

OF

THE ALLIED SOCIETIES

VOL. IV.

DECEMBER, 1909

No. 4

THE HEART OF THE DENTIST.

Professional skill is accepted as the leading factor in professional success. It will be difficult to convince the student of dentistry that another factor is equally important; but if success is to be measured not by income alone but by the service rendered humanity and the satisfaction which comes from doing the greatest amount of good to the greatest number of people, then the cultivation of the heart must not be neglected in dental education. The development of a sympathetic and humane attitude toward mankind in general, and in particular toward people who seek professional skill, will go far to advance a man on the road to success; and the quality of success so earned, precious beyond all others, enables a man to pass a mirror without hiding his eyes. It enables him to speak or remain silent in a meeting of dentists with the satisfactory knowledge that he is trusted and believed. The love of little children, the blessings of the poor, and the respect of the respectable belong to the man who adds to his professional skill the love of work for the good it may do.

Go up into one of the high buildings in New York City and look down upon the busy life in the streets, upon the rivers, and upon the bay. See how the pigmies below you crawl and wriggle or puff from place to place; each one filled with the sense of his own importance; each one believing his own interests paramount; each one unable to see around the corner; each one unable to know

the life of the other. You alone know—you alone can see—you are looking down at the game and you know that each disabled player will have his place filled with a competent substitute and few will know the difference. You know that few of the specks of humanity down below stop to inquire the purposes of life or reflect upon the consequences of their actions; but as you look and ponder it is born in upon you that all this activity is the result of a plan. It is not given even to you to decipher the meaning of it, but you know it could not go on for a moment if it were not for the plan; and then you realize that as the stoker on an ocean liner,—perhaps the poorest and meanest creature on board,—plays an important part in the progress of the steamer and the comfort of the passengers, so the poorest of those creatures you look down upon from the Tower Building has some part to play in this mysterious plan of life. And it comes to you that work well done, performed with the heart's desire to help in life's work, does some how or other make the world better; while the greatest activity, the most strenuous endeavor, if self-centered and ignoble may serve only to retard the development of the wonderful plan.

Work we must and with all the professional skill we possess but let us know the joy of disinterested work for the good of our race and the glory of our profession. Professional work is entitled to material reward and professional fees are too high only when the work is done because of the fee which is to follow. Not in high fees but in work done solely for the fee lies the danger, and many a brilliant professional life has been wrecked upon this reef. Give of yourself to relieve suffering, to prevent disease, to promote health, and to improve the condition of mankind and you will never regret the profession you have chosen. Its darkest days will be brightened by the knowledge that your life has not been in vain and that the world and your profession have been the better because you have lived.

SAMUEL A. HOPKINS.

COMMENT.

This, the December number of the Journal of the Allied Societies, may well be called the Massachusetts Dental Society number, as it has been thought best to publish the proceedings of that society for the year 1909 in one issue.

As a consequence of this action, much valuable material from the proceedings of the other societies is necessarily withheld until the next number of the Journal.

MICROSCOPICAL OBSERVATIONS OF THE SALIVA.*

BY ARTHUR W. DOUBLEDAY, D. M. D., BOSTON, MASS.

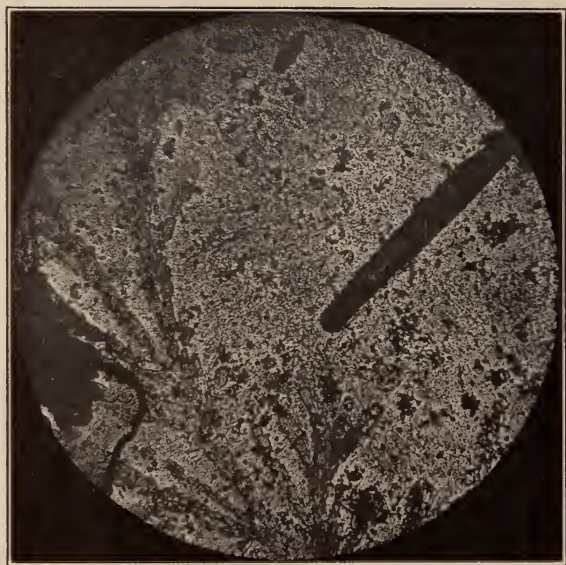
Throughout the entire medical world there has, within the past few years, been a general awakening among the diagnosticians of the many diseases so prevalent among the human race, to the fact that the further study and knowledge of the analysis of the saliva will one day prove to be of some value, by at least combining this with his present blood and urine analyses, and is it not fair to presume that the man who is constantly giving his efforts and attention to the care of the organs and soft tissues of the mouth (and also the adjacent vital organs), should be the one to co-operate most heartily with his brother practitioner, in an untiring effort to assist in bringing about a practical method for the best means of such analysis?

Accuracy and the utmost carefulness of technique in every detail must be carried out in all instances or one's time is spent for naught. Even in making the simple chemical tests for chlorin, sulphurcyanide, ammonium, acetone, lactic acid, etc., etc., our reagents change and deteriorate so rapidly that there exists the greatest dissatisfaction and disappointment with this part of the work.

One of our most honored professors in a research laboratory in New York recently became so discouraged with the careless analytical reports of his assistants, that he decided to try and impress upon these men their lack of personal interest and accuracy

*Read before the Boston and Tufts Dental Alumni Association, April 14, 1909.

in ascertaining results. He, therefore, prepared specimens containing various amounts of arsenic, a careful record was kept of the amount in each specimen, no two being the same. These were given out, and when the analytical reports were returned, he found his suspicions were justified, and the men themselves were much surprised when the facts were presented to them. For example, the report presenting the largest per cent. of arsenic came from the specimen known to contain the least in reality, and the others were proportionately inaccurate.



No. 1 Represents case of "Protein Diet. (Sedentary Life) "

The above facts born in mind, may perhaps allow us to better understand the depth of the remark, which many here present will recall having heard Dr. Kirk make to our own Dr. Leary, at a meeting similar to this not long since. The substance of the remark was as follows: "If a man could be found who would do this work for the *love* of the work, regardless of compensation, the opportunity, fully equipped laboratory, etc., awaits him, with money at his disposal."

However, in my own work a chemical analysis for certain elements is made in all cases and recorded, together with a brief clinical history, but my grèatest satisfaction and pleasure is in the

study of the microscopical elements found in the saliva, some of which it will be my pleasure to present to you upon the screen, after reviewing briefly a more or less general idea of the composition and functions of the saliva, and the chemical changes which take place in the living organism of either plants or animals.

SALIVA.

The saliva as it is found in the mouth is a colorless or opalescent, turbid and mucilaginous liquid of about 1.003 specific



No. 2 Represents case of Vegetable and Fruit Diet

gravity, and with a weakly alkaline reaction. It may contain numerous flat cells derived from the epithelium of the mouth, and the peculiar spherical cells known as salivary corpuscles, which seem to be altered leucocytes.

Among the important constituents of this secretion are mucin, a diastatic enzyme known as ptyalin, maltase, traces of protein and of potassium sulphocyanide, and the inorganic salts such as potassium and sodium chloride, potassium sulphate, sodium carbonate, and calcium carbonate and phosphate. The carbonates are particularly abundant in the saliva, and the secretion contains in addition, much carbon dioxide (CO_2) in solution.

Pflüger found that 65 volumes per cent. of CO_2 might be obtained from the saliva, of which 42.5 per cent. was in the form of carbonates. The amount of CO_2 in solution and combined, is an indication of the active chemical changes in the gland.

Of the organic constituents of the saliva the protein exists in small and variable amounts, and its exact nature is not determined. The mucin gives to the saliva its ropy, mucilaginous character, and is a substance belonging to the combined (or Glyco-) proteins, consisting of a protein combined with a carbohydrate group.

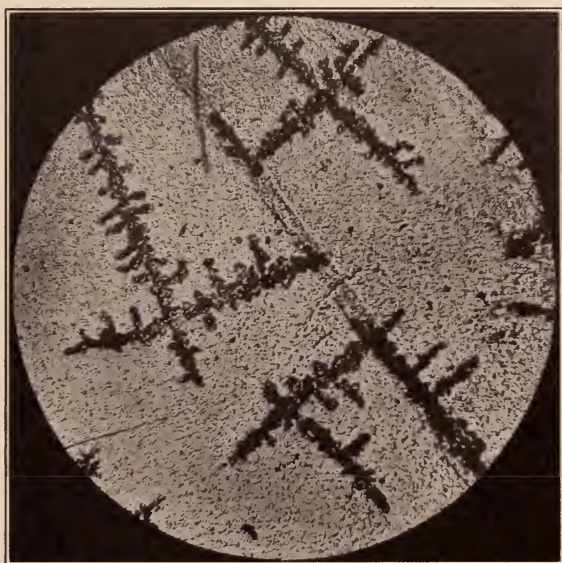
The most interesting constituent of the mixed saliva is perhaps the Ptyalin, which belongs to the group of enzymes or unorganized ferments, and which substance has never, to my knowledge, been satisfactorily isolated. It is, however, called Ptyalin, and according to many of our physiologists, its action is best carried on in a slightly alkaline mixed saliva, or nearly so, therefore may we not consider this for our present work and study a normal reaction, although admitting that its action may be carried on nearly as well in a neutral medium. A strongly alkaline solution, however, retards, or entirely inhibits its action, while a strongly acid reaction, not only retards its action, but destroys the ferment itself.

If you will examine carefully, the separate secretions, which may be done by inserting a canula into the openings of the ducts of the mouth, it will be found that the main difference lies in the fact that the parotid saliva contains no mucin, while that of the submaxillary and especially of the sublingual gland is rich in mucin. The parotid saliva seems to be particularly rich in ptyalin as compared with that of the submaxillary, while the secretion of the latter and that of the sublingual give a stronger alkaline reaction than the parotid saliva.

The chemical composition of the saliva is found to change with regard to the relative amounts of the water, the salts, and the organic material under stimulation to the chorda. Heidenhain leads us to believe, from his experiments that there may be two physiological varieties of nerve fibres distributed to the salivary glands: one controlling the secretion of the water and inorganic salts, and its fibres may be called therefore, secretory fibres, while to the other the name trophic is applied, and which causes the for-

mation of the organic constituents of the secretion, probably by the direct influence on the metabolism of the cells.

The method of changes brought about by the action of the trophic fibres may be supposed to be catabolic in nature, that is, they consist in a disassociation or breaking down of the complex living material, with the formation of simpler and more stable organic constituents of the secretion. That these changes involve processes of oxidation is shown by the fact that during activity



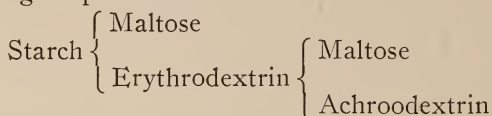
No. 3 Represents case of Faulty Metabolism. (Preceding Pneumonia.)

the gland takes up more oxygen and gives off more carbon dioxid. There is evidence to show that these gland cells during activity form fresh material from the nourishment supplied by the blood; that is, that anabolic or building-up processes occur along with the catabolic changes.

The method of action of the secretory fibres is perhaps at present, almost entirely speculative, but in a general way it is believed that the effect of the nerve impulses is to cause the production of substances within the cells whereby their osmotic pressure is increased, and a stream of water is set up from the blood in the capillaries toward the gland cells.

THE DIGESTIVE FUNCTIONS OF THE SALIVA.

The digestive action proper of the saliva is limited to the starchy foods. While the number of intermediate products may be large, the main result of the action of the ptyalin is expressed by the following simple scheme:



The products formed in this reaction are probably not absorbed as such. The absorption takes place mainly, no doubt, after the food reaches the small intestine, where the maltose and the dextrin are probably acted upon by the inverting enzymes (maltase) and converted into simpler sugar, dextrose. The ptyalin digestion seems, therefore, to be preparatory, and the combined action of ptyalin and maltase is necessary to get the starch into a condition ready for nutrition.

The chewing process in the mouth thoroughly mixes the food and saliva, or should do so, but the bolus is swallowed much too quickly to enable the enzyme to complete its action. Our recent researches have proven that nature has made ample preparations for such emergencies, if not carried to excess, by allowing the salivary digestion to be carried on for a considerable length of time after the food reaches the stomach, accomplishing this in the fundic end, untouched by the ferment destroying acid of the gastric juice for probably an hour or more.

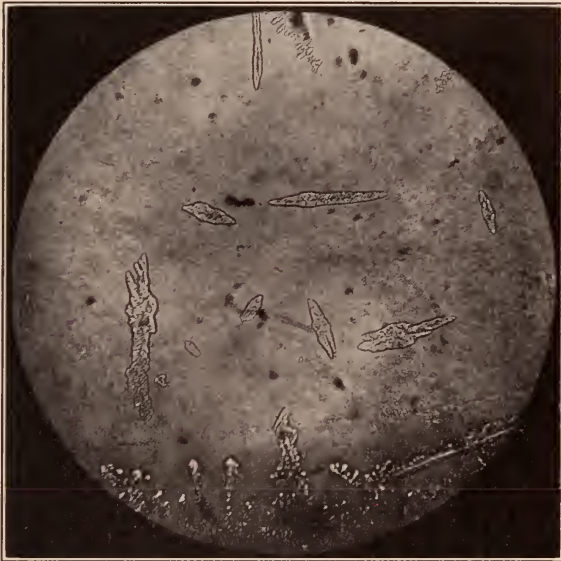
In addition to the digestive action of the saliva on starchy foods, it fulfills other important functions with proteins and fats. By moistening the food it enables us to reduce the material to a consistency suitable for swallowing, and for the manipulation by the tongue and other muscles. The presence of mucin serves, doubtless, as a kind of lubricator that insures a smooth passage along the esophageal canal. Finally by stimulating the taste nerves, and the activity of the taste sensations, it may play an important part in the secretion of the gastric juice, which destroys the further action of salivary digestion, and whose ferment (pepsin) converts the proteins to peptones and proteoses.

Fats are probably not especially acted upon chemically, until their entrance into the stomach, after which they are split up from neutral fats into fatty-acids and glycerine, by the enzyme (steap-

sin), coming from the pancreatic secretions, the fat-tissues, blood, etc.

CHEMICAL CHANGES IN THE ORGANISM OF PLANTS AND ANIMALS.

The chemical changes taking place in the organism, are either normal (as in health), or abnormal (as in disease). The abnormal products formed by these changes are usually termed "pathological" products.



No. 4 Represents case of Pyorrhea.

As we know, the plant takes up as food a small number of inorganic substances such as:

Carbon dioxide
Water
Ammonia, NH_3 ,
Nitrates, Mx NO_3 ,
and

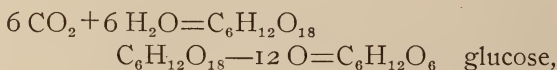
Phosphates,	{	Calcium,
Sulphates, of		Magnesium,
Chlorides,		Sodium,
		Potassium.

It converts them into organic substances of a more and more complicated composition with the simultaneous liberation of oxy-

gen, while we as animals take up these organic vegetable substances of a complex composition, assimilating them in our system, where they are used (burned up), and finally discharged as waste-products, which are identical (or nearly so) with those substances serving as plant-food, viz.:

Carbon dioxide,
 Water,
 Urea, $\text{CO}(\text{NH}_2)_2$,
 Urates, $\text{Mx C}_5\text{H}_2\text{N}_4\text{O}_3$,
 and
 Phosphates, { Calcium,
 Sulphates, of { Magnesium,
 Chlorides, { Sodium,
 { Potassium.

We can, therefore, state that the difference between vegetable and animal life, in general, is that the chemical changes in the plant are progressive or constructive, while in the animal they are regressive or destructive, and may we not represent this change in a manner to best impress it upon our minds by the following equation:



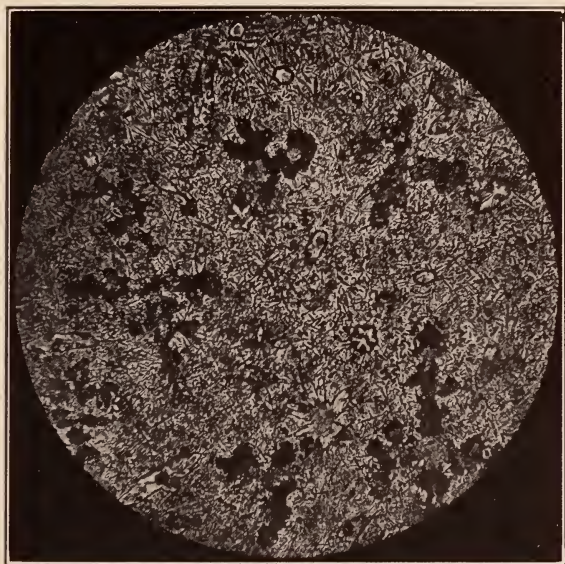
representing a constructive chemical change in the plant, while if we take glucose, $\text{C}_6\text{H}_{12}\text{O}_6 + 12 \text{O} = 6 \text{CO}_2 + 6 \text{H}_2\text{O}$, we have an equation representing in the animal system, a process of chemical decomposition, as a destructive change, that is to say, the substances formed in the plant are taken into the animal system, where they are gradually oxidized by the inhaled atmospheric oxygen, thereby being converted into simpler forms of combination, which are finally eliminated as waste products.

The tissues of the body are built up, and the energy supplied, by what we call animal food. This food (aside from water and a few of its mineral constituents) is all derived from vegetables, but may be taken either directly, or indirectly (by its previous assimilation by other animals) and coming to us as meat, milk, eggs, etc.

The source of the elements taken up by the plant for the formation of the organic matter, is chiefly by the roots. The assimilation of the necessary mineral constituents is brought about by an acid secretion (discharged from the roots), which has a tendency to render these salts (present in the soil and surrounding the

roots) soluble. Water having absorbed more or less of the soluble salts, enters the plant, as stated (by the roots), and by a simple process of diffusion, is carried to the various green parts (chiefly the leaves), where the sunlight produces chemical decomposition and the formation of new compounds, and oxygen is liberated directly through the leaves to the atmosphere.

Carbon appears in the cycle of life, as carbonic acid, and it is in this form that all plants derive it from the atmosphere and



No 5 Represents case of Pyorrhea.

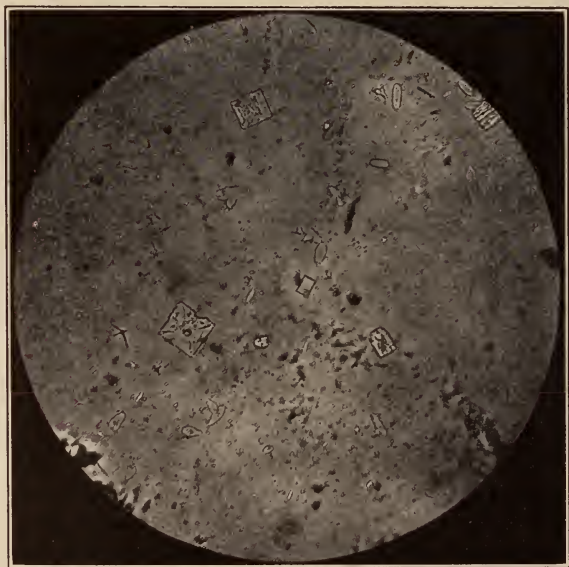
convert it into the numerous combinations of which they are composed.

Hydrogen is taken up by plants in the form of water and ammonia only; it enters into the constitution of the organic compounds of the plants which serve as food for animals; it leaves the animal organism again in the form of water and ammonia, or in the shape of compounds which rapidly split up into these two bodies.

Oxygen is the only element which enters the living organism in a free state, but it does so only in part, and in the case of plants only to a very small extent. The chief bulk of the oxygen enters the organism of plants as water and as carbonic acid. By

the aid of sunlight, the plants split off from these combinations a part of the oxygen, and form compounds richer in carbon and hydrogen, which as food-stuffs are taken into the animal body, where they again unite with oxygen, and are returned as carbonic acid and water to the air.

The bulk of free Nitrogen has no part in vital processes, for the plant cannot assimilate it. It is taken up by the plant, however, as ammonia, nitrites, and nitrates, and is converted into and forms part of numerous and most complicated substances, chiefly proteids. In the latter form it enters the animal economy, where the proteid breaks down into urea, uric acid, and other compounds, which rapidly decompose outside the organism and yield ammonia.



No. 6 Represents case of Pyorrhea.

Sulphur is widely distributed in organic nature as sulphates of the alkaline earths and alkalies, and enters the vegetable organism in this form, taking part in the building up of the proteid molecule, in which form it enters the animal organism.

Phosphorus enters the plant as phosphoric acid, chiefly united with bases of the alkalies and alkaline earths, where it takes part in the formation of very complicated combinations (of the vari-

ous forms of lecithin and nuclein) which are integral constituents of every vegetable and animal cell. It is chiefly in these combinations, and only to a small extent as salts, that phosphorus enters the animal body, which it leaves in the same form that it entered the plant, as a phosphate.

Chlorin occurs in nature in the form of salts, chiefly united with sodium and potassium. In this form it enters and leaves the cycle of life, and takes no part in the formation of organic compounds.

Sodium, Potassium, Calcium, and Magnesium occur in the organic world only as salts, enter plants as such, combine very loosely with organic matter, and are excreted from the animal body also in the form of salts.

Iron plays the very important part in our organism of oxygen-carrier, occurring as a complex organic compound, the most complicated perhaps which has hitherto been investigated, and called hemoglobin, which, as oxy-hemoglobin, is a loose compound with oxygen, and forms the coloring matter in the blood.

All of these twelve chemical elements enter into the composition of the living being without exception, and therefore play an important part in the microscopical observations with which we are to deal in our study upon salivary analysis.

PROCEEDINGS OF THE MASSACHUSETTS DENTAL
SOCIETY

At Its Forty-fifth Annual Meeting, Held at
Boston, June 9, 10 and 11, 1909.

The meeting was called to order Wednesday afternoon by the President, Dr. Ned H. Stanley, New Bedford.

The first order of business was the reading of the records of the last meeting by the Secretary, Dr. C. W. Rodgers, Boston. They all were approved as read.

The next order of business was the report of the Board of Councilors.

The next order of business was the report of the Committee on Dental Supplies. Chairman, Dr. Horatio C. Meriam, reported that in the Metropolitan District there had been appointed a Committee on Information, from which information on this and kindred subjects could be obtained, and that the work was progressing well.

Motion: That the report be accepted as indicating progress. Carried.

The next order of business was the reading of the President's address. The President, Dr. Ned A. Stanley, having called Dr. C. S. Hurlbut to the chair, then read his address.

PRESIDENT'S ADDRESS TO THE MASSACHUSETTS
DENTAL SOCIETY, JUNE 9, 1909.

BY NED A. STANLEY, D.M.D., NEW BEDFORD.

Another milestone has been passed, and in the full vigor of our manhood we are met to participate in this the forty-fifth annual meeting of our Society.

The gospel, according to Article I of the By-Laws, commands that the President give a concise statement of the condition of this and the District Societies.

Custom seems to have designated the production of a "President's Address" as an occasion when he may relieve himself of wads of wisdom, lose himself in flights of oratorical eloquence, or touch upon any subject from the magnetic variations of the Gulf Stream to the price of gooseberries in Zanzibar.

The immediate effect of this mandate upon the present in-

cumbent has been to produce a kind of sinking sensation, experienced no doubt by some of my predecessors in office.

First, I wish to express my appreciation and thanks to those who have contributed or shall contribute to the success of this meeting, and particularly to the chairmen of the different committees upon whom devolves the burden of work which has been well and faithfully done.

The Metropolitan District has held four regular meetings, at which papers were read and discussed, no clinics being given. On January 16th, at the instance of the Metropolitan District, a meeting of the allied societies was held to further the work of the Conference Committee of the Dental Hygiene Council. The meeting was very largely attended, Prof. Eugene H. Smith presiding. Lieutenant Governor Louis A. Frothingham, Prof. Irving Fisher, of Yale University, and Prof. Timothy Leary, of Boston, were guests and speakers. Several members of the Institute of Stomatology from New York were present. Drs. Howe and Kimball, who are especially interested in this great work of oral hygiene and the education of the public to its needs, were among the speakers. Much good came as the result of this meeting and the conference which was held the following week.

The Metropolitan District Dental Society offered a graduate course, open to any member of the State Society upon the payment of \$10.00. The instruction consisted in lectures as well as practical work done by those taking the course. Eighteen evenings were devoted to this work, extending through the months of November, December and January, part being given at the Harvard Dental School and part at Tufts College Dental School. Drs. Harold DeWitt Cross, F. S. Belyea, G. B. Squires, George C. Ainsworth and Alfred P. Rogers supplying the course. The mention of these names is sufficient guaranty that the thirty or more who joined the class received many times the worth of their money in valuable instruction. It is to be hoped this work may continue. The District has made a gain of twenty-one during the year and now has a membership of three hundred and forty.

The Southeastern District has held three meetings during the year—this being the usual number—consisting of clinics, papers, and the showing of practical cases. We have a membership of eighty-nine, a gain of sixteen for the year.

The Central District has held seven meetings during the year, and some papers on timely subjects given, as "The Education of the Public in the Call to Dental Health," "Oral and Dental Hygiene," "Prophylaxis," and "The Relation of Mastication to Digestion." Five new members have been added, three dropped for non-payment of dues, and one member transferred to the corresponding list, thus making a gain of one, the membership now being forty-five.

The Valley District has shown its usual activity, holding eight regular meetings, besides a corn roast. Papers upon interesting and timely subjects, as well as clinics, have been given. The membership remains the same as last year, eighty-seven, the five new members admitted being offset by three dismissals for non-payment of dues, one resignation, and one removal from the district.

I am pleased to learn that the verdure is still green in the Western District. One meeting has been held and one paper read upon the appropriate subject of "The Absurd Side of Dentistry." The District does not seem to be prolific, but is healthy. The membership remains the same, twenty. "We're twenty, we're twenty, who says we are more? He's tipsy, young jackanapes, show him the door."

I am pleased to record that the Society, as a whole, is in an active, flourishing condition, with a total membership of five hundred and eighty-one active members, making a gain of thirty-eight for the year.

We are living in the most wonderful age for inventive genius, scientific investigation and research that the world has ever seen. It is a great day in the history of our profession. Dentistry, like surgery, has been slow of public recognition, but a profession containing the possibilities, requiring such unerring judgment and nice technical skill in the execution of that judgment, is sure to receive the recognition to which it is entitled, and hold its rank unshaken of motion.

The immediate future, nay, the present, is rich in possibilities. It is calling us as never before, and our part is an important one in carrying on what is but a portion of the great world movement of reform, of better understanding how to live, of better understanding and practice of oral hygiene, which in its faithful observance means the prevention of disease. Through the cen-

turies of time the Great White Plague has thinned our ranks, and not until *our* day is it being demonstrated that a large percentage of tubercular cases are preventable, and that, too, by the simple observance of the laws of hygiene, better ventilation, cleanliness, and plenty of pure air and sunshine. Particularly would I urge the attention of the members to the work of the Hygiene Council. Let me quote, stating the purposes of the Council:

"Its purposes are to educate the public as to the necessity of keeping the teeth and mouth clean and healthy; to establish dental hygiene in schools as a part of medical inspection; to promote the control and prevention of tuberculosis and other infectious diseases; to inspire general interest in saving the teeth—the much neglected organs of nutrition."

This is a work of the utmost importance, and one that affects and should interest every dentist in the community—as the work of education along this line should, very properly, largely come from him. To obtain the results which are the aim of the Council, a vast amount of practical clinical work must be done, work which can only be done by a skilled dentist, the immediate benefit of which will be a potent factor in education.

Just what will be the best plan of action for carrying out this work is a problem that must work itself out. In the city of Boston there are two dental schools, with every equipment and facility, which simplify matters for this locality. But elsewhere it is different. I feel that the expense should be borne by each municipality, and hope some day it may be done. In the meantime effort may be followed by indifferent success or failure, which ultimately will resolve itself into a practical working plan.

I earnestly recommend that this Society join the National in a body. At present the National Dental Association is in no sense representative, and if a union of the different State Societies could be brought about it would result in an organization worthy of the name. I also recommend that this Society take action with reference to legalizing prescriptions from dentists.

I would touch upon one other subject, viz., that of prophylaxis, the most important subject in dentistry to-day. Here, again, we have prevention.

No better illustration of the saying, "The cart before the horse," can be used, it seems to me, than that of the relation of

the dentist to his profession. I believe we are performing operations every day, a large percentage of which are preventable.

No branch of medical science offers richer returns, and no more reasonable proposition ever presented itself to a scientific body of men than the subject of "Oral Phophylaxis." When once you grasp this subject, simple and effective in its technique, and incorporate it into your practice with the same energy and zeal with which you perform other operations, a red-letter day will have dawned for you.

To-day we are carrying the torch! As each incoming wave leaves its mark a little higher on the sands of time, may we, when we cross the bar at ebb-tide, feel that our efforts have helped to carve the record of our day and generation—another story added to the Palace Building.

When I was a King and a Mason—
A master proven and skilled—
I cleared me ground for a palace,
Such as a King should build.
I decreed and dug down to my levels,
Presently under the silt,
I came on the wreck of a palace,
Such as a King had built.

There was no worth in the fashion,
There was no wit in the plan—
Hither and thither, aimless,
The ruined footings ran.
Masonry—bruit mishandled,
But carven on every stone:
"After me cometh a Builder,
Tell him I, too, have known."

Swift to my use in my trenches,
Where my well-planned ground works grew,
I tumbled his quoins and his ashlar,
And cut and reset them anew.
Lime I milled of the marbles,
Burned it, slaked it, and spread,

Taking and leaving at pleasure
The gifts of the humble dead.

Yet I despised not, nor gloried,
Yet, as we wrenched them apart,
I read in the razed foundations
The heart of that builder's heart.
As he had risen and pleaded,
So did I understand
The form of the dream he had followed
In the face of the thing he had planned.

When I was a King and a Mason—
In the open noon of my pride—
They sent me a word from the darkness,
They whispered and called me aside.
They said, "The end is forbidden,"
They said, "Thy use is fulfilled,
And thy palace shall stand as that other's—
The spoil of a King who shall build."

I called my men from my trenches,
My quarries, my wharves and my shears;
All I had wrought I abandoned
To the faith of the faithless years;
Only I cut on the timber,
Only I carved on the stone:
*"After me cometh a Builder,
Tell him I, too, have known."*

REPORT OF THE BOARD OF COUNCILORS.

FIRST MEETING OF THE BOARD.

The first meeting of the Councilors of the Forty-fifth Annual Meeting of the Massachusetts Dental Society was called to order Wednesday morning, June 9th, 1909, by the President Dr. N. A. Stanley, New Bedford.

The first order of business was the calling of the roll of the Councilors by the Secretary. The following members answered to the roll call: N. A. Stanley, C. S. Hurlbut, C. W. Rodgers,

C. E. Abbott, J. T. Paul, C. R. Lindstrom, F. T. Taylor, W. E. Boardman, W. H. Potter, H. C. Meriam, C. W. Partridge, L. D. Shepard, F. S. Belyea, E. O. Kinsman, G. E. Mitchell, C. C. Patten, J. W. Bailey, M. C. Smith, C. E. Parkhurst, C. F. Harris, S. I. Moody, W. W. Marvel, T. P. Sullivan, A. F. Wyman, J. F. Allen, H. P. Cooke, R. A. Bush, A. F. Wheeler, W. H. Richardson, W. E. Booker, R. R. Stimpson, C. H. Mack, G. A. Maxfield, W. H. Jones, N. Morgan, C. W. Hale, A. J. Flanagan.

The next order of business was the reading of the last meeting's records by the Secretary, Dr. C. W. Rodgers, Dorchester. Discussion: Dr. L. D. Shepard, Boston. "I think the first report of the Nominating Committee should be left out or be included in its entirety, as at present it is misleading. It should be either omitted or it should be stated clearly that Dr. Savage declined to be a candidate for re-election as president. It would be sufficient to state that the committee reported and was instructed to make another report."

Motion: That the records, amended as suggested, be accepted. Carried.

Motion: That a nominating committee of five be appointed by the President, two from the Metropolitan District and one each from the other three districts represented. Carried.

The President appointed Dr. F. S. Belyea and Dr. C. E. Parkhurst, Metropolitan; Dr. R. A. Bush, Central; Dr. Wesley Hale, Valley, and Dr. W. W. Marvel, South Eastern.

The next order of business was the choice of the place of meeting for the coming year.

Motion: That we meet in Springfield in 1910.

The secretary read an invitation from the Springfield Board of Trade.

Motion carried.

The Program Committee, through its chairman, Dr. Waldo Boardman, reported that the printed program as sent to the members of the Society was the report of the work of the Printing and Program Committee.

Report accepted.

The next order of business was the report of the Registration Committee. Dr. Luther D. Shepard, chairman, reported that as a result of recommendation the retiring members of the board, Drs. John F. Dowsley, of Boston, and George F. Mitchell,

of Haverhill, had been reappointed by the Governor, and reviewed the details of the deliberations of the members of the committee.

The report was discussed by Drs. Bailey, Shepard, Broadman, Sullivan, Marvel, Mitchell, Meriam, Kidd and others.

Motion: That the report of the committee be accepted. Carried.

The Committee on Nominations presented the following list of nominations for the officers for the ensuing year:

President, Cornelius S. Hurlbut, Springfield.

First Vice-president, Eugene H. Smith, Boston.

Second Vice-president, Carl Lindstrom, Boston.

Secretary, Charles W. Rodgers, Dorchester.

Assistant Secretary, C. Edson Abbott, Franklin.

Treasurer, Joseph T. Paul, Boston.

Editor, George H. Wright, Boston.

Report accepted.

The Committee on Legislation presented the following report:

At the beginning of the year, the chairman wrote to different members of the committee and to the chairman of the State Board of Registration of Dentistry, asking what matters, if any, should engage the attention of this committee for this year. The chairman of the State Board of Registration replied that he had nothing for the committee to work upon, and a similar reply was received from the different members of the committee, hence no constructive work has been attempted by the committee this year. The chairman appeared at the State House at several hearings in connection with bills pending before the General Court.

In opposition to a bill placing the preliminary and professional education of students of medicine, dentistry and pharmacy under the control of the State Board of Education and in favor of a bill to further define the practice of dentistry strengthening the existing State law.

In January the chairman received a letter directed to Dr. John Dowsley, Chairman Board of Registration in Dentistry, signed by J. A. McGeough, stating the cause of the failure of the prosecution of the officers of the "G. Gordon Martin, Inc.," and the other two dental corporations who were fined in the lower

court, and discharged in the superior court. As but eight days intervened between the time I received this letter and the last day of admitting new matter before the General Court, the chairman felt that it was too late to take action this year on the bill to remedy this defective point. It was introduced by Dr. W. W. Marvel, Fall River, Mass., and your chairman appeared in support of this bill at the committee hearing.

FRANK T. TAYLOR,
Chairman.

January 12, '09.

Dr. John F. Dowsley,
Chairman Board of Registration in Dentistry,
175 Tremont Street, Boston, Mass.

Dear Doctor:

As I told you the other day, the officers of the "G. Gordon Martin, Inc.," and the two other dental corporations who were convicted in the lower court some time ago, were all discharged in the Superior Court one day last week on a ruling of the court. I did not then know the exact ground of the decision. From an interview with the judge to-day, however, and also the district attorney who argued the case, I have learned, and, of course, the board as well as the Dental Society ought to know.

The trouble is not with last year's amendment, but rather with the consolidation of the Public Statutes of 1902 by the commissioners in omitting what seemed to be superfluous words in order to condense the law,—the complaint in these cases were in substance that these so-called dental corporations, of which the defendants were officers, by using the word "dentist," etc., in connection with their names and by advertising, were "practicing dentistry," and the court holds that "practicing dentistry" is nowhere prohibited in law, and accordingly the defendants in these cases were discharged.

This may strike you as a little extraordinary and I must say, to me, after a good deal of study and reflection, the obvious intention of the Legislature is plain, and this seems to be a somewhat strained construction of the law. You may read it over carefully a great many times and not discover this technicality, but it is there; so the court holds and the only remedy is in an amendment of the law.

The court seems to hold that while a person may not perform an operation on the human teeth or jaws, or make examination, etc., with that intention, without obtaining a certificate from the board, yet "practising dentistry" is nowhere specifically forbidden, so it seems that any person or corporation may "practice dentistry," certificate or no certificate, with impunity.

I doubt very much if the Supreme Judicial Court would uphold this decision, but there is no way that the prosecution can procure the opinion of the Supreme Judicial Court, as the Commonwealth has no right of appeal, so that this decision of the Superior Court stands as law.

Now, let me suggest that in order to have the Legislature of the present session act in this matter, there is no time to lose, as I understand the 23rd of the present month is the last day for the introduction of new business. Let me also say as I know your Society in the interest of the profession itself, as well as that of the public at large, wants to stop these so-called dental corporations, with their questionable methods, from exercising those rights and privileges that within the intention of the law properly belong only to individuals duly qualified and registered as required by law, that the entire law in this particular should be carefully studied so as to avoid any doubt as to its meaning in this regard, and I trust you understand that even aside from my employment in the matter I shall be glad to render any assistance that I may be able to give.

Yours very truly,

(Signed) J. A. McGEOUGH.

Motion: That the report be accepted and placed on file.
Carried.

The Treasurer, Dr. Paul, then presented his annual report, which was accepted on motion.

DR.

June 2, 1908—Balance to new account..	\$1,461.20
To Cash from Western District.....	72.00
“ “ “ Central District	90.00
“ “ “ So. Eastern District	120.00
“ “ “ Valley District	170.00
“ “ “ Metropolitan District ...	664.00

"	"	"	Local Com. Nat. Dental Association	500.00	
"	"	"	Sec. acct. Certificates....	36.00	
"	"	"	Int. on bank balance....	19.40	
"	"	"	Com. on Exhibits Annual meeting	217.50	
					\$3,350.10

CR.

By cash—Rent of hall.....	\$10.00	
" President's expenses, 1908-'09.....	30.69	
" Sec., salary and expenses.....	52.10	
" Treas., salary and expenses.....	27.66	
" Local Com. Nat. Dental Ass'n.....	500.00	
" Dental Hygiene Council	100.00	
" Acct. "The Journal".....	26.68	
" Stenographer at annual meeting.....	12.50	
" Legal services (McGeough) Com. on Prosecution	200.00	
" Engrossing Diplomas	2.85	
" Com. on Legislation.....	7.20	
" Executive Committee	38.38	
" Printing, including programs 1908-'09	483.72	
		\$1,491.78

June 7, 1909—Balance cash on hand..... \$1,858.32

The Nominating Committee, through its chairman, Dr. Bel-yea, then announced that Dr. Wright was unable to accept the position of editor owing to pressure of research and other business.

Motion by Dr. Boardman: That the report of the Nominating Committee be accepted and the Secretary be instructed to cast one ballot for the list as submitted, except that the editorship be left open until the afternoon session. Carried.

The Secretary then cast one ballot for the list as read, except the editor.

Report of the Hygienic Council was read by Chairman, Dr. Wm. H. Potter.

Our figures are made up for the year ending December 23.

I can give you, in a general way, a sketch of what we have done in the last year and a statement of what it has cost us. We have maintained a travelling exhibit because it has been in demand. It has covered practically the same territory as the tuberculosis exhibit. That means a great deal because this tuberculosis exhibit is organized. Nearly every month I have spoken in connection of this work. We have certain printed things which we furnish to those who ask for them, one of these being a pamphlet whose circulation has been between twenty and thirty thousand. There is also a pamphlet by Dr. Hopkins, "How to Care for the Teeth and Mouth." We are hampered in that we cannot produce literature as fast as asked for. We have given advice to those who wish to found dental clinics. We have had inquiries from all over the United States and from foreign countries.

In January we held a dental hygiene conference lasting a week. We were able to get together a large audience for our talks on dental and oral hygiene, thereby calling this to the attention of a very large number of people who previously thought very little about the importance of this work. It was expensive, costing us \$500, but was worth several times that much, in my opinion. We had to personally solicit from outsiders to pay up our debts. At the present time the Council has on its books only \$45. There has been a bill of \$67, which has been assumed by a professional brother, which I hope will be paid by this Society. The first year up to December 23, 1908, we raised and spent about \$500. I append a financial statement showing our expenditures and receipts since that date.

The members of the Council realize that there is a tremendous revival throughout the world in reference to this subject and the care of the teeth of school children. There is no question about the importance of the work of this committee. We need money from the Society. It is not going to be possible for the committee to keep begging from the profession and from outsiders. For this reason I would like to ask the Society to make an appropriation for this work of at least \$200 for the coming year.

Motion: That the report be accepted and that the committee be given a vote of hearty thanks.

Dr. Flanagan—I want to say that this thing has created

more interest in dentistry than anything that has been done before.

Motion: That the Society appropriate \$300 for this work. Carried.

The Editor, C. W. Lindstrom, then presented his annual report as follows: We published various reports of meetings, analyses, papers, etc., in "The Journal" at an expense of \$60 out of the \$300 appropriated. Report accepted.

The Clinic Committee, Dr. C. E. Parkhurst, chairman, then presented as a report the list of the clinics printed in the program. Invitations had been sent to every member of the Society. It is desirable to get all the members awake and interested in this matter.

The Exhibit Committee, Dr. F. T. Taylor, chairman, presented its report as follows: We have provided the usual space and the exhibits are there. The new rules adopted by this Society two years ago providing that only those remedial and prophylactic substances of known formula could be admitted to the exhibit kept out almost all of the antiseptic mouth washes, etc. The large exhibit, two years ago, rather more than paid for the hall. This year it will come short of it by perhaps \$100. I think that the cutting out of the secret remedy people from the exhibit has been a good thing. I think it will make the exhibits more valuable to the Society and to those exhibitors who want to show supplies. The committee voted to allow the exhibits to be open to everyone and the clinics and meetings to be open to members and guests only.

The Committee on Law, in the absence of its chairman, J. F. Dowsley, reported through Dr. A. J. Flanagan as follows: That the amendment to the dental law had been passed as reported by Dr. Marvel.

The Essay Committee reported that its report was contained in the printed program.

The Committee on Necrology reported, through its chairman, Dr. C. W. Rodgers, as follows:

MASSACHUSETTS DENTAL SOCIETY.—OBITUARY.

F. Arthur Ryder, New Jersey, October 11, 1908. Metropolitan District.

Isaac H. Halvey, East Milton, April 14, 1909. Metropolitan District.

Jerome P. Tripp, New Bedford, January 8, 1907. South Eastern District.

William H. Webber, New Bedford, April 12, 1907. South Eastern District.

Frank R. Dickerman, Taunton, May 16, 1908. South Eastern District.

The Committee on Remedial and Prophylactic Preparations reported as follows: Seven manufacturers of remedial and prophylactic preparations applied to the Committee on Exhibit for space to exhibit during our 1909 annual meeting. They were referred to this committee. *Two were tentatively approved* and allowed to exhibit, as they apparently did not violate the rules adopted by this Society which read as follows: "No article shall be admitted unless its active medicinal ingredients and the amount of such ingredients in a given quantity of the article be furnished for publication. The general composition of the vehicle, its alcoholic percentages, if any, and the identity of the other preservatives, if present, must be furnished."

If the trade name of an article is not sufficiently descriptive of its chemical composition or pharmaceutical character, a descriptive title must be given.

Five were rejected as they violated the first rule. Your committee at the last annual meeting referred to the intention of preparing a booklet of formulas of interest to the dentist. We report progress in this work and expect that it will be ready for the members at the next annual meeting, as it is nearly all in manuscript at the present time.

Respectfully submitted,

G. B. SQUIRES,

GEO. H. WRIGHT,

CHARLES W. RODGERS.

The Committee on Dental College Infirmaries for Charitable Purposes reported as follows:

Early in the year the heads of both dental schools in Boston were approached on the subject of the use of the infirmary in their respective schools for charitable purposes during the time they were not in use for school purposes. The management of both schools received the idea with favor and expressed their willingness to allow such use of their infirmaries as was con-

sistent with their school use, under certain restrictions, which were in both cases not difficult to comply with.

We would add that since these interviews, and we believe, in consequence of them, a free clinic has been established at the Harvard Dental School, with a limited number of operators under the auspices of the school, serving the poor that are recommended by organized charities of Boston, on Saturday afternoons. An organization under the name of "The Metropolitan Dental Hospital" has been established by Dr. Belyea and contains quite a number of names, and is now in a position to do active work.

Signed,

CARL R. LINDSTROM, *Chairman.*

FRANK T. TAYLOR,

HORATIO C. MERIAM.

Dr. Waldo E. Boardman moved: That the President and Secretary of this Society be empowered to sign delegates' certificates to all members intending to be present at the Fifth International Dental Congress, to be held at Berlin, Germany, August 23 to 28, 1909. Carried.

Dr. Waldo E. Boardman moved: That a committee of five be appointed from each District Society to act as a committee on attendance and transportation, and that the Secretary of each District Society appoint its own members. Carried.

The Committee on Dental Education presented its annual report through its chairman, Dr. F. S. Belyea, as follows: When this committee was appointed there were no known duties and so we have gone around looking for something to do. Drs. Belyea and Lindstrom constituted the committee, Dr. Eugene H. Smith having resigned. Dr. Lindstrom went into the educational business quite actively. The committee took up the question of education along dental lines as shown by the pamphlet which I shall submit. Two courses are under way at the present moment. We sent out three hundred and fifty invitations to the Metropolitan District. One of the classes has twenty-three members at present. In addition we have gone into the book publishing business, and have for sale at this meeting a number of books, educational along dental lines, patent nostrums, proper drugs, etc. Report accepted.

The Secretary, C. W. Rodgers, read reports from the different District Societies of the State, and from the National Dental Association. Also a letter from H. C. Brown, Corresponding Secretary of the National Dental Association, inviting the Society to take action to join the National as a body on payment of annual dues of two dollars per member.

Motion: That the report of the National Dental Association be accepted and its recommendation adopted. Carried.

Secretary Rodgers read communications from the Tufts Dental School renewing the offer of its infirmary for Massachusetts Dental Society Hospital use, from the Boston Merchants' Association, requesting list of members, by-laws, etc., and from Dr. Boardman in regard to the Miller Memorial.

Motion by Dr. Boardman: That the Society appropriate the sum of \$50 for the Miller Memorial. Carried.

Motion: That a committee of three be appointed by the chairman to bring in a list of nominations for a committee on the Board of Registration. Carried.

Motion by Dr. Maxfield: That Dr. Chester Twitchell Stockwell be placed on the honorary list of the Massachusetts State Society. Carried.

Motion by Dr. Boardman: That we take up the amendment to the by-laws found in the printed program. Carried.

Motion by Dr. Boardman: That the amendment be laid upon the table. He offered the following resolution:

Resolved, That the Massachusetts Dental Society, in convention assembled, desirous of furthering the interests of this Society and that of the National Dental Association, by reason of the establishment of a national dental journal for the whole profession, a journal for the publication of the proceedings of the Society, and for the influence it will wield in legislation in State and nation, hereby agrees to and accepts membership in the National Dental Association; and that the dues of each member of this Society shall be increased two dollars, to be paid yearly to the Treasurer of the National Dental Association, which sum includes membership in the National and the subscription to the Journal of the National Dental Association, to be published beginning in October, 1910.

Dr. Taylor—It seems to me it would be a good plan to pass

this amendment now so that we shall be an official part of the Journal of the Allied Societies.

Dr. Boardman—We can publish our proceedings at our own expense in the Journal now without joining the Alliance.

Dr. Meriam—We should do everything possible to present a united front in the matter of dental journalism.

Dr. Boardman—If you pass an amendment now it comes up in the general session this afternoon.

Dr. Potter—I hope this matter will not be laid on the table. It is time for Massachusetts to make a square stand and give its moral influence for the cause. We ought to go on record with the allied societies, and be known as one of them.

Dr. Taylor—The question is simply: "Shall we put our hands in our pockets and sustain it?"

Dr. Flanagan—What is the probable expense of printing Dr. Boardman's way or in joining the alliance direct? Will the Secretary read the amendment?

Secretary Rodgers read the amendment. Amendment to By-laws: Article IV, Section 1, add the following: "One dollar of which shall be set aside for payment of this Society's share of the expense of the Journal of the Allied Societies, and by virtue of such payment each member of this Society shall become a subscriber to this Journal, such subscription terminating with his membership."

Motion by Dr. Flanagan: That a committee be appointed by the chair to solve this situation. Carried.

The chair appointed Drs. Taylor, Boardman and Maxfield.

The previous motion to lay on the table was voted not carried.

Adjourned.

SECOND MEETING OF THE BOARD.

The second meeting of the board of Councilors was held Thursday at 9.30 A. M. President Ned Stanley called the meeting to order. After Wednesday's session the President appointed as a Committee for Nomination for Registration Committee, Drs. Frank Taylor, Carl Lindstrom and Wesley Hale.

The Committee on Amendment to the By-Laws reported, through its chairman, Dr. Taylor, as follows:

The committee has not come to any particular agreement, so this is not a regular report. As regards probable expense I will say that I have here a copy of our 1907 proceedings, printed by the Cosmos, containing 107 pages, which at the Journal rate of \$1.80 per page, would be \$192.60. The 1906 proceedings had 86 pages. The entire cost of the last March Journal was—

Advertising receipts	\$50.00
Metropolitan Society	43.98
Institute of Stomatology	98.36
Academy of Stomatology	2.99
Boston and Tufts Alumni.....	6.59
Harvard Odontological	2.99
Massachusetts Dental Society.....	14.25

\$219.16

The cost of postage, cover, leading article, etc., of that issue was \$89.19.

It would seem that our share of the excess cost should be very small. For instance, the Metropolitan paid \$7.98, or 32 per cent. of the net cost of binding, covers, etc., in proportion to its subscribers. The printing expense of the Metropolitan published articles was \$36 for 20 pages at \$1.80 per age.

Dr. Henry P. Cook—One dollar per subscriber must be set aside in order to comply with the postal laws, although this need not necessarily be spent.

Dr. Taylor—This is probably only a temporary matter anyway, as when the National Journal is published this Society will quite likely join it and publish its proceedings in it.

Dr. Meriam—It seems to me that we shall be safe on the financial side and it seems to me to be only an opportunity to express our willingness to join these efforts and hold to them. Let the Massachusetts Society join the Alliance.

Dr. Boardman—How will the joining of the Massachusetts Society affect the District Society?

Dr. Taylor—Probably the districts as members would withdraw.

Dr. Flanagan—If the Massachusetts Society joins, each District Society is relieved of its responsibility. If we simply

publish the proceedings we pay for that publication. What is our total liability?

Dr. Taylor—As previously stated, \$1.80 per page, plus binding etc. Probably \$200.

Motion by *Dr. Flanagan*: That this Society be responsible according to the postal laws for the sum of \$600 and that its responsibility financially for publishing the proceedings be \$300.

Motion by *Dr. Taylor*: That the amendment in the program be adopted. Carried.

Motion by *Dr. Boardman*: That his resolution in regard to joining the National Society be adopted. Carried.

Motion by *Dr. Boardman*: That the following amendment to the constitution and by-laws be put over for a year as provided by the rules. Carried.

The Committee on Nominations for the Committee on Registration then submitted the following report through its chairman, *Dr. Taylor*:

The committee appointed to nominate the Committee on Board of Registration, considering that there was an entirely new committee desirable, submits the following names:

Charles E. Parkhurst, of Somerville.

H. Winchester Hardy, of Boston.

Alpheus R. Brown, of Boston.

Ned A. Stanley, of New Bedford.

William F. Gilman, of Worcester.

C. Wesley Hale, of Springfield.

William H. Fallon, of Pittsfield.

We further recommend that this committee be instructed to elect its chairman, and a secretary; that it cause its records to be kept, and such records to be produced at the Councilors' meetings.

Signed.

FRANK T. TAYLOR,
CARL R. LINDSTROM,
C. WESLEY HALE.

Motion by *Dr. Boardman*: That the Secretary be instructed to cast one ballot for the list of nominees. Carried.

The Secretary cast one ballot electing the list of nominees.

Resolution moved and carried as contained in the last paragraph of the above report.

The Nominating Committee, Dr. Belyea, chairman, then presented as their further nominations:

For Editor, C. Edson Abbott, Franklin, Mass.

For Assistant Secretary, Coleman Tousey, Boston, Mass.

Dr. C. Edson Abbott resigned the office of Assistant Secretary and the Secretary was instructed to cast a ballot for the above two officers, who were declared elected.

NEW BUSINESS.

Dr. Flanagan—Something is wrong that there is not a larger attendance in the Massachusetts Dental Society. Some officer should go around to the District Societies and get some novelties and good things and get the District Societies in better touch with the parent societies. I object to a man's studying in a private office and being allowed to compete with graduates. Also it is not right for a former President to make an attack in the public press upon dental education and to state that there is no use in a college education.

Dr. Taylor—I agree very thoroughly with Dr. Flanagan's remarks. I would like to see a committee appointed to see whether anything cannot be done to correct this crying evil. Men should not be allowed to enter our profession without proper preliminary education.

Dr. Belyea—The very same committee that was appointed to make nominations to the board should be a very good committee for this thing.

Dr. Sullivan—I suggest that that question be referred to the incoming Executive Committee to consider this question and report back to us. We should get men into the Society if we have to strain a point. Then he will not be likely to go wrong or to leave the Society. We have the funds and I believe the President should occasionally delegate men to go to the local societies and find out why the men are not coming in. In Fall River we have made good men through joining the Society.

Dr. Flanagan—I say that a separate committee should be appointed to deal with this question and close up illegal dental societies. We have other things to consider than dental jour-

nals. The committee should be made up of three men who have work in them. When a man applies to the State Board of Massachusetts without a degree he thereby admits that he has been violating the law of this State if his practice was obtained in this State.

Motion: That a committee of three be appointed by the President to carry out these suggestions. Carried.

Dr. Boardman—I think the Secretary should have a list of all the members of the State Society to be furnished him by the local secretaries.

Motion: That the secretaries of the District Societies be instructed to furnish the State Secretary with a list of the members, annually, and that any resolutions, additions, deaths, etc., be reported to him so that the State Secretary may have accurate lists of the members of the State Society. Carried.

Motion: That the Treasurer of the State Society be instructed to pay the Treasurer of the Central Society six dollars refund for over payment. Carried.

Motion by *Dr. Lindstrom*: That *Dr. G. E. Bates* be made an honorary member of this society. Carried.

Dr. Sullivan—There should be a committee to solicit the members of the graduating classes to join the State Society.

Dr. Abbott—I heartily endorse this. As the twig is bent the tree is inclined. In our Franklin Business Men's Oral Hygiene meeting we local dentists invited the vicinity dentists to come and to join the State Society, with little direct result. It is only seed sown which may sometime ripen. Get the recent graduates, who are more easily induced, to join. A man with a few years' practice, who is fairly successful, does not realize his loss and lack of development because he is out of touch with organized dentistry. If necessary, lessen the dues for the first few years and get a member for life.

Dr. Boardman—This was formerly done, but the Associate membership was done away with under the reorganization.

Motion: That the Treasurer serve without salary as do the other officers. Carried.

Motion: That the salary of the editor be \$25. Carried.

There being no further business the Council adjourned, sine die.

AFTERNOON SESSION.

The society listened to papers as follows: "Dental Dispensaries as Sanitary Educators of the Public," by Carl R. Lindstrum, D.D.S., Boston, and "Public School Instruction in Oral Hygiene," Paul G. White, D.M.D., Boston.

DENTAL DISPENSARIES AS SANITARY EDUCATORS
OF THE PUBLIC.

BY CARL R. LINDSTROM, D.D.S., BOSTON, MASS.

Two words, now gaining standing in the vocabulary of the common people, as well as in the working speech of social reformers, stand for great constructive ideas and ideals which are to reign during this century. These words are Prevention and Co-ordination. Clergymen as well as chemists, educators as well as bacteriologists, philanthropists as well as physicians are bent upon preventing, where formerly they were keen to remedy. The time of attack is earlier, the stage of intervention is a more fundamental one, the intention is to conserve, not merely preserve or repair. Hence the altered program of many a church, school and altruistic agency. Hence the emergence in the realm of state and national activity of new policies, designed to prevent economic waste, to conserve natural wealth.

Coincident with this universal trend towards constructive and conserving social action, goes the other and natural movement for co-ordination of remedial and preventive agencies. The reason is simple. Waste in fighting against waste, is illogical. Duplication of machinery and effort in doing common work is absurd. Moreover, where there still remains justification for separate existence and specialized functioning, the interdependence of all life, makes co-operation necessary.

The dentist of to-day and to-morrow faces a world of this sort. The call of society upon him, to serve it as promoter of sound physical health, as a teacher of oral hygiene to schools and social settlements, as a factor in human uplift, is coming to be as strong, as it hitherto has been upon men of other professions. And this service he is to render best when co-operating with educators, sanitarians, scientifically trained administrators

of charity, physicians, and disseminators of intelligence like journalists and authors.

A dental dispensary and clinic, carried on with the ideals of Prevention and Co-ordination in mind, must furnish, as its range of activity extends, and its prestige waxes, a centre of information valuable not only to the dental profession, but to all the other social agencies. The visitor of the Lynn Dispensary, for instance, through her personal observation of childrens' homes, and their environment in other respects, is competent to advise with such other social workers as the city may have, on general social problems. Seeing many of the children repeatedly, she has noted their defects physical and mental, which may be remedied in part or in whole, by co-operative treatment of dentist, physician, surgeon or alienist, providing the discoveries made by dentist and visitor in the dispensary are followed up by co-ordinated social action. Co-operating with school authorities, and they with dental dispensaries, an attack can be made at once on conditions, which repeated examinations have made clear, exist in all schools of all classes of society, and which account for so much of the unsatisfactory results of our public and private schools. The dispensary dentist and the visitor, not only may, but do get, through the contact which the service makes possible, information as to malnutrition, impaired breathing capacity and general physical conditions, which they can at once use for the benefit of patients and society at large, in a way impossible at present with the private patient. Moreover, it is not beyond the range of possibility that the dispensary visitor in supplementing the work of the dentist, as she or he goes from home to home, may detect conditions there, which, when made known in suitable ways to proper authorities, would be abolished in the interests of morality and sound social health. Beginning with simple care of the teeth, the work in its larger ramifications may come to be a factor in civic reform.

In fact, both theory and practice, as the four month's experiment at the Lynn Dispensary has shown, point clearly to the intimate relation between dental sanitation and sanitation in general. The process of combating ignorance or defiance of the one leads to light on the problem of the other.

The best proof of the service rendered by a dental dispensary augmented by its intelligent sympathetic visitor is a con-

crete case of betterment of total physical and mental condition. One of the first cases brought in by the visitor for treatment at the Lynn Dispensary was a child about eleven years old. She was anaemic, hollow-eyed, gaunt, palpably underfed and diseased. Examination of the mouth showed that every tooth in her mouth was decayed. Some were so far gone as to be beyond treatment, all needed attention. The net impression of the mouth was one of utter neglect and general decay. Pus exuded from several of the sockets, and the total effect was revolting to the observer.

The task of cleansing, repairing, filling and extraction completed, the child was preached to in all seriousness as to her future duty, and equipped with brush and powder, was sent home, but not forgotten. The visitor immediately visited the home and impressed on child and parents the duty of change of habits and constant care. Close watch was kept on the child. Immediately a change for the better in physical appearance was noticeable. It has continued to this day so that the transformation is startling. Freed from pain at night, the child sleeps. She chews her food, because the chewing apparatus is in order. The masticated mass enters the stomach and intestines minus numerous bacilli, which formerly were present. Consequently, the child has gained in flesh, in color, in animation, and in zest in life.

Nor is this *all*. She has become a zealous, youthful missionary of the gospel which has saved her. She has won her own family of four persons, to a care of their teeth never known before. She has converted her little playmates, back to better habits in dental hygiene at home, and also to resort to the dispensary for examination of their teeth and such care as is prescribed for them there. This gospel she preaches insistently, when at play or as a regular business of street corner propaganda. And it is an effective sort of preaching, because so wholly unselfish, and because so splendidly supported by the transformation in her own case.

The case is especially interesting because of the extremity of her need, and the ardor of her zeal in spreading the "good news" of physical redemption; but it is a *typical* case, not an extreme or singular one at all. Thousands of children in the schools, for lack of similar investigation, are the easier prey to disease, are slow and lethargic in study and "retard" the class. Co-operating in similar service, schools, settlements and dental dispensaries,

can work out transformations in physical, mental and economic efficiency, which will add vastly to the wealth of the country.

It may be of interest to some of you to know a little more about this Lynn Dispensary, as I consider it a fair illustration of the phase of usefulness we are trying to extend.

Owing to the generous co-operation of eleven Lynn men and some seven or eight from Boston and vicinity, we have been able to treat 175 children, representing 500 operations. The work is two-fold, consisting of dental operations accompanied by instruction in hygiene of the mouth, and the necessity of proper mastication; and secondly, of following-up work in the homes of the patients. The children who have come to us represent six nationalities.

Through the courtesy of both the Florence Manufacturing Company and the Theodore Metcalf firm we are able to buy a good brush at 50 cents a dozen and powder of simple ingredients at 25 cents a pound. These we sell at actual cost.

These are "good things" which we are trying to "push along," but of course their adoption is a slow process. We meet with strenuous opposition to our preaching an individual brush and powder for each one. One little girl was quite willing to own them for her own needs, when told how necessary to cleanliness and health but she "*did not* think *papa* needed one, for he had one he had used since he was ten years old, though the hairs *had* come out *some*, and it *was* one-sided."

But we have conquered in about 100 cases and the reform is slowly but surely *spreading*.

The work in its second phase of visits to the home has been carried on from the beginning, by the secretary of the Dispensary. About 200 calls have been made during this period of four mouths. It is the purpose of these calls to impress upon the parents—the mother usually—the absolute necessity of caring for the teeth by the habitual use of the brush after each meal, to urge her to co-operate with the dentist in his efforts to put the child's mouth in a normal condition. The number of calls is not limited to the number of applicants as some cases need following up repeatedly.

In order to best acquaint the City of Lynn with the establishment of the Dispensary, it has been the desire of those interested and in charge, to reach such children as need the help,

through the schools by examination by teachers and school physicians, and reference to the clinic of such cases as cannot afford to employ the regular practitioner, although our rule is to make a small charge for all services rendered, whenever practicable; also by five or ten minute talks on Oral Hygiene as well as the necessity of thorough mastication, by the secretary in each class room, at stated intervals of time. It is, therefore, with great pleasure that we report the recent endorsement and active co-operation of the School Board of Lynn to take effect in the school work this coming fall. This opens a path of assured success for the work, by the official recognition and support of school trustees, through whose co-operation *should be found* the natural and legitimate door to prosperity.

Our work is meeting with assured recognition from the larger body also. We have the official endorsement of the Secretary of the State Board of Charities of the Secretary of the Society for the Control and Relief of Tuberculosis, and of the Secretary of the State Board of Education.

PUBLIC SCHOOL INSTRUCTION IN ORAL HYGIENE.

DR. PAUL G. WHITE, BOSTON, MASS.

Much time has been spent in a search for that something that will increase the length of man's life, improve his health and, incidentally, add to his happiness. For hundreds of years search has been made and numerous remedies declared quite sure to succeed if faithfully used, but all of these have been short-lived disappointments. It may be that we will yet find such a remedy or panacea, but we rather incline to the belief that the prolongation of life will follow right living, correct diet and the observance of hygienic laws, and prophylactic measures that will keep us free from infection and contagion.

While there has been a great deal of scientific advancement more recently along certain lines of investigation which has been progressive for the healthfulness of people in general, still we can see abundant evidence of people, perhaps a majority of whom are women and children, whose physical condition and apparent healthfulness are not what we might expect.

We know that people suffering from organic and functional

nervous and mental affections are becoming rather alarmingly common, and that people suffering from various bodily afflictions and physical defects, who are unable to earn a living and are a charge upon benevolence of some kind, are becoming more numerous.

That our methods of living at the present time may have something to do in the bringing about of these conditions there is not much doubt. It is evident that the strenuous life in our modern public school system has not in the past, and even at the present time, is not yet so perfect but that it still affords annually a small army of broken-in-health, nervously afflicted, deformed, pitiable recruits.

To-day conditions have somewhat improved, but there is still great need for further improvements in the development of the bodies of the school boy and girl, for it must not be forgotten that the scholar consists of a body as well as a brain, and that the physical constitution must suffer if the body is neglected in order that the brain may be too rapidly worked.

Our young people are anxious to "learn." They crowd our colleges and are in turn crowded full of all the accumulated knowledge of the ages, while little, if any, attention is given to what they eat, where they sleep, or regarding what care they give their bodies. They are finally graduated with honors and some of them never make any use of the knowledge gained, for of what use is it to a semi-invalid who knows nothing of the care necessary to keep the thinking and working machinery in good condition? They are taught that everything in this world moves along according to law *excepting our own bodies*; here they are encouraged to believe that one may continually violate natural laws and when illness comes a healer may be employed who will pray or drug them back to health. To one who has gotten his eyes thoroughly opened, this appears extremely absurd, but isn't it just what our young people are being taught? Drugs by one healer or prayer by the other will be so powerful that the very laws of life and death may be violated with impunity (?).

If it is true that the public schools have served as an incubator for the development and the dissemination of more disease than any other single cause known, then is it not the duty of the school to arouse its pupils to intelligent thought on the importance

of better modes of life? Surely to compel a child to attend school and subject it to infection that may result in sickness or death, if conditions making this possible are known to those in authority, is nothing short of an unjustifiable crime.

If every individual practiced rules necessary to escape from infectious disease, public hygiene—chiefly concerned with preventing the spread of infection—might go out of business; thus personal hygiene becomes the basis of public hygiene. For the man who lives on his own estate, conforming to the rules of hygiene, public hygiene need not exist, but if he leaves his estate and travels into society public hygiene steps in. Public hygiene says, "What you do for yourself at home, we do for you in public."

Hygienists should especially consider school children under three heads, 1st, age; 2nd, surroundings and close contact; 3rd, special conditions connected with education.

The age period may be said to exist between the 5th and 15th years. It is here that we find the highest mortality rate and this is due almost wholly to communicable, hence preventable, diseases. As this period is the largest determining factor in the future efficiency of the child's mind, so is it the time during which the future efficiency of the body is decided for good or bad. Our state laws declare that whatever else is done with a child's time in school he shall be taught hygiene and physiology. The cursory and indifferent attention paid to hygiene can be evidenced by almost any school curriculum. The garbled and inferior text books used in many states are devoted largely to the evil effects of alcohol and tobacco, and there is not, to my knowledge, a book used in our public schools to-day that contains a chapter on oral hygiene, which should be the longest and most important in the whole book, and we come to the conclusion that the state has failed lamentably on this fundamental topic of education and that hygiene, as taught in the public schools, is a sinister practical joke. The remedies are self evident and can be briefly stated: 1st, to teach real hygiene in schools by adequate teachers and text books; 2nd, to sweep our present farce out of the schools and consign it to the junk heap where it belongs.

If medical inspection in the public schools has been inaugurated to prevent the spread of disease among children attending the schools, then it seems to me that such prevention of diseases

ought not to be wholly confined to the prevention of infectious diseases only. Let such inspections go a little deeper. Let the medical inspectors remove the predisposing causes of the maladies children are prone to contract at school.

A brief consideration of the predisposing causes will not be out of place.

As the oral cavity has been fittingly termed the "Gateway of Life," so may oral hygiene be correspondingly styled the "Gateway to Health," or the 'key to all personal and domestic hygiene. As personal and domestic hygiene is closely related to sanitary science, this same key may open the way to a larger and broader application of state and municipal hygiene. Oral hygiene may be defined as that sub-division of general hygiene treating of the care and proper use of the mouth and teeth. As the healthy body depends upon the air it breathes and the food it assimilates and as both of these are directly affected by the conditions in the oral cavity it is not an exaggeration to say that three-fourth of the ills of mankind will be banished as soon as the mouth and teeth receive the care and attention they require.

The important question which arises here is, "How is this care and attention to be brought about?" The answer, "By educating the public," and then the again and unanswered question, "How?"

As a worthy example set by a large city is readily followed by smaller cities and towns, let us consider what has been done in our own city of Boston towards establishing oral hygiene in the schools.

In the first place, our Massachusetts Medical Inspection law calls for the physical examination of every school child for any disability or defect, tending to prevent his receiving the full benefit of his school course. If we consider dentistry a branch of medicine, and who will say it is not, I submit to you that the laws are ineffective.

Now, because of the ineffectiveness, I took the matter of oral hygiene before the Boston School Board and the Boston School-masters' Association in the spring and fall of 1907, through the influence of Hon. J. F. Fitzgerald, then mayor of Boston. Upon suggestion of the Superintendent of Schools, I read a paper on "The Necessity of School Instruction in Oral Hygiene" before

some three hundred schoolmasters. This paper created considerable enthusiasm and the masters made many requests for lectures on the care of the mouth and teeth in the schools of Boston, which were given and proved to be a great success. In April a paper entitled "More About School Instruction in Oral Hygiene," widely distributed among the masters, added greatly to the interest already shown. This was followed by a petition to the School Board asking for the establishment of a course of Oral Hygiene in the schools. This petition was referred by the School Board to the Board of Superintendents for consideration and report, and at a meeting of the School Committee on February 20, 1908, they reported as follows:

"The board heartily appreciates the desirability of inculcating habits of dental cleanliness among school children, and that much attention is given to the subject by many teachers. The Board of Superintendents believe that this is a matter which should properly engage the attention of the Department of Physical Training and Athletics, and recommends that it be referred to that department to consider means and methods for making instruction along these lines more effective."

The communication in which this report was embodied was placed on file and the recommendations of the Board of Superintendents were adopted by the School Committee.

By request of the Director of Physical Training at a meeting shortly after February 20th he informed me that if I could get the endorsement of the Metropolitan District of the Massachusetts Dental Society he could practically assure me that some kind of a course would be established during the coming year. Upon presentation of this proposition to the Metropolitan District it was referred to the newly established Dental Hygiene Council of Massachusetts, that is, it took an unnecessary trip out of the hands of the Metropolitan Society and that is where it is to-day. Now, gentlemen, I ask what you are going to do about it?

They say that the far reaching relations of dental health or disease to health or disease in general are as yet very little appreciated. How, then, may they be appreciated? Will dental examinations alone bring this about? Perhaps,—but with the best result,—No! Cities and towns are not as a general rule in condition financially to undertake the proper care of school children's teeth and, even if they were, it is most uncertain

whether this would be the best way out of the difficulty. Then, while lectures are productive of much good they only reach a comparatively small part of the population, whereas a course in oral hygiene would permanently affect the entire generation. The want of a suitable text book, however, makes us rather timid about approaching school authorities and it seems to me that this can only be rectified in the following manner.

Perhaps the reading of two letters will illustrate what I wish to say. As a member of the Oral Hygiene Committee of the National Dental Association I have written to a number of the authors of the various text books on Physiology and Hygiene used in the public schools of this country the following letters:

"Dear Sir:

As there is at the present time no hygiene or physiology used in our schools or colleges which contains a chapter on oral hygiene, I am writing to ask if you would be willing to have incorporated in your book a chapter on oral hygiene compiled and copyrighted by the National Dental Association. We are endeavoring to have oral hygiene taught in every public school in the Union and this seems to be the only way to obtain a uniform course of instruction. I should be glad if you would make any suggestions in regard to the same.

Sincerely yours,

(Signed) PAUL GARDINER WHITE."

A reply from Dr. Seneca Egbert, one of the leading hygienists of this country, reads in part:

"Shortly after receiving your letter I consulted my publisher as to the advisability of your proposal and found that he was quite willing to consider it seriously. He suggested that it might be well to ask you to send on the manuscript of the proposed chapter, so that we might judge not only of the subject matter but also as to how much space it would take. As I understand it, there is not much likelihood of there being another edition of my book published this year, but my publisher informs me that your chapter might go in as an insert in copies not yet bound just before the index together with an explanatory paragraph or two.

Yours sincerely,

(Signed) SENECA EGBERT."

Now do not these letters bring out the best way to introduce oral hygiene all over this country in the shortest possible time without objection by School Boards, Boards of Education, Legislature, etc., on account of expense?

The suggestion of Dr. Corley, of the National Committee, that the State Association create standing committees to act as sub-committees to the National Committee with such changes and modifications as may be thought best to meet the needs of their special fields, and that they submit an annual report to the National Committee is, I believe, a very necessary step to carry on this national campaign. If this co-operation cannot be secured, then of what real use is our National Dental Association.

As a member of the Oral Hygiene Committee of the National Dental Association it is my duty to present and urge the following out of our plans for the coming year.

First, we wish the president of every state society in the Union to appoint a committee on oral hygiene to work in connection with the National Committee, and to have, through them, every sub or independent organization in the States elect or appoint committees to work in connection with us. If this can be done we will have every organization that is working along the oral hygiene line report to us directly upon what they are accomplishing, and when anything new that is worthy of consideration comes from any source whatsoever it will be compiled along with other good suggestions, printed and mailed to the other committees at work throughout the country as well as to school boards, chambers of commerce, boards of health, charity institutions and every other organization which may be brought into play to advance the interests of this work.

This will give us the benefit of the best minds throughout the entire country, and will send a wave over the land which will do far more good in one year than could be accomplished in years by each individual organization working separately.

The great need of popularizing oral hygiene may be shown by the following report of the United States Census which shows a population of 80,000,000 people constantly increasing. Statistics show that less than ten per cent. of these ever patronize the dentist. From these figures we may say that almost 70,000,000 people need information on oral hygiene. If every person in the United States went to the dentist each dentist would have 2,500

patients on his list. As only ten per cent. go it averages 250. And people say there are too many dentists! It is said that all the dentists in this country, working eight hours a day the rest of their lives, could not begin to do the work for the people of Greater New York needing dental services.

Individually and collectively we can do much in diffusing dental knowledge.

One cannot be brought face to face with an earnest company of school teachers, numbering 1,500 or 2,000 men and women, such as was recently assembled, without having some comprehension of the relation which such a body of workers sustains to the future of our city and state, and without feeling how large a place they should occupy in the respect and interest of all classes of our urban population.

This is a matter in which we hope not only the members of our organizations, but also every village improvement society, grange and women's club will be interested. It is an especially appropriate subject for women to take hold of, inasmuch as the whole effectiveness of the movement will depend upon the degree of interest which children's mothers take.

If women at their clubs would spend more time on the subject of the education of their own children, rather than studying the old masters, French and German literature, the reading of trashy books, and playing bridge, the conditions surrounding the children of this country, which would tend to make them sound in body and mind, would be all that we desire.

A movement is on foot in Boston at the present time, and it includes the whole state, to give us a newer, better busier, cleaner, and more healthful city in 1915. Can this be done effectually without the introduction of oral hygiene into the public schools?

Let us raise our banners to the public gaze inscribed, "Oral Hygiene in 1915."

DISCUSSION OF PAPERS OF DR. LINDSTROM AND DR. WHITE.

Dr. Belyea—I am going to ask you to consider the clinic at the Harvard Dental School. In pursuance of a plan formulated last year a committee called upon the dental schools to form a clinic. As you know by the report from the committee, this has been done in that there is a very good clinic at the Harvard

Dental School and it works in conjunction with and under the supervision of this organization that we call the Metropolitan Dental Hospital Association. Volunteers to the number of something like fifty have been enrolled. New ones are constantly available and we hope to have a good clinic, and improve it when the school is moved up to the Huntington avenue building. I will answer any questions that may be asked about it.

Question. Do you consider it a practicable thing to conduct a dental clinic as you would conduct a private practice, particularly in respect to the teeth? There are a large number of children having poor teeth and without private dentists. Is it practicable to treat these the same as in a private office?

Answer. It depends upon the number of schools and the number of children. If too much work presents itself you can do only a little. In such a clinic you will have to extract and do the best you can. You will have both work and instruction in trying to improve the little ones' teeth. At the Harvard clinic they are making a very small charge to all hands except when they cannot pay even this. In such cases the charitable organizations pay the fee. They are sent to us by some organization. At present this work is doing individual dentists as much good as it is the children.

Question. What charges are made and how many patients can you take each afternoon?

Answer. At present we have the use of the Infirmary only two afternoons, from 2 P. M. to 4.30 or 5 P. M. I have earned as high as \$1.65 in one afternoon. Fillings cost from 10 to 25 cents, extractions 10 cents, etc. We want to teach them to co-operate by paying a little. As to the number of patients, I have had as high as five for treatments, extractions, etc. Usually two or three are all I can do as these patients have each a great deal of work to be done. We try to get the mouth into some sort of order.

Question. How do the ages average?

Answer. From five or six to twelve years or sometimes older. The first patient I had was a girl who was being sent to one of the Boston schools.

Question. I wonder if these patients come from the poorer

classes? Do some children come whose parents might pay for them?

Answer. This has not yet occurred. There is no trouble, as our people are indorsed by some organization.

Question. Do you find you have considerable extraction to do?

Answer. Practically little. Mostly saving, and treatments of temporary teeth. In this connection I would state that the Central District is about to open a clinic in Worcester early in July and has secured splendid quarters.

Dr. Boardman—There has been a clinic of another character formed in Brookline through the initiation of the superintendent of schools. The town is paying for the dental work of the poorer children. Fortunately it came up through Dr. Potter, so we are going to get that switched off so that the Metropolitan District Dental Society will get the credit.

Question. Is there any similar clinic?

Answer. I have a letter from Tufts stating that they are hoping to have a similar clinic. There ought to be a free interchange of the graduates of both schools, neither schools nor dentists making any difference, all co-operating.

Question. Is there any work now being done at the Tufts School?

Answer. The work at present is done entirely by students. They have a large crowd and do excellent work. In the clinics the children are instructed that they must have their teeth clean before any work is done.

Dr. Pond—We Franklin dentists do not have quite the proposition you city dentists have. There is occasionally a chance to do some missionary work among the children. There are occasionally some cases which come to me where I could not get anything for my work. We do not have a large class of poor children to work for and I think in the town of Franklin practically all of the people have a good idea of taking care of their own teeth, so that we have less of the charitable work to do.

A short time ago we local dentists, all of whom are members of the Massachusetts Dental Society and among whom a cordial feeling exists, held a well attended meeting before the

Franklin Business Men's Association, at which talks were delivered by Dr. Edward Otis on "Oral Hygiene in Relation to the Great White Plague, and General Diseases," and by Dr. W. H. Potter on "Care of the Teeth, with Especial Reference to Prevention." This gave the public a better idea of our profession. In the fall we hope to hold a meeting before the Alden Club, a ladies' organization.

Dr. Belyea—Practically all dentists have many calls for charitable work and practically every dentist is doing lots of this work. But the public does not know that we take any interest in such matters. We should not hide our light under a bushel.

The members of the Massachusetts Dental Association in Boston number about three hundred and fifty and they are about all you can depend upon to help you in this work, since if a man does not take enough interest to join the Society he will rarely do anything else.

Dr. Hosley, Springfield—I have been very glad to hear these papers. Very sensible thoughts have been brought out for our use. We should all gather a certain amount of inspiration from these papers. I was especially interested in the little experiences that Dr. Lindstrom brought out in his papers. They are of a character educational to the profession. It may be a question as to what are the best means to the end. I think that the education of the children in this matter has perhaps been best brought out in the work which the German government is doing. It was brought out that in the Army Field Day Exercises the men were not able to do the work which the regulations called for. Investigation developed that most of the soldiers were unable to masticate their food. The medical report was that the present conditions should be remedied, and it seemed best the money should be expended upon the common soldier. In Germany the government is taking up the examination of the school children and in many of the States it is compulsory and many municipalities are obliged to pay for keeping the mouths of the school children in sanitary condition. If a government considers this important how much more does this deserve attention from each one of us individuals? Really, there are conditions in civil life which are of great importance in spreading contagion, so that the condition of the mouth bears upon this subject and it seems to me that a propaganda on the same lines,

which might bring the same results, should be begun by the dental profession.

I think Dr. White's subject a very good one. I am rather surprised that it has not been done before. The individual has a good chance to help along this at his chair. I think Dr. Lindstrom and his clinic will accomplish many results. I will now speak of a little experience in Springfield. It seems that the Board of Health formed an opinion that nothing good could be done in regard to a free clinic. I disagree. The individual effect of the dental hospital is worth all the effort. I think the profession will find the difficulty will be to find how to handle the tremendous subject. And I find the individual dentist doing a great amount of charitable work. The medical profession says we do no charitable work. I complain that we have not received credit. Such papers as we have had to-day and the constant pounding at it is bound to bring results.

Both the medical and dental professions do much charitable work. But too much of this will hamper the movement which needs its financial support to be used to greater effect than in fixing the teeth of the poor. A number of clinics have been swamped by the work which has been presented. We have such a great work before us that we should wisely husband our resources and put our efforts where they will mean the most. Our ultimate object must not be lost sight of. We have been teaching and the people have been learning the financial worth of sanitary mouth conditions. The Panama Canal would have been impossible without sanitary science. From a financial standpoint it is impossible to over-estimate what sanitary science has done for the country at large and what the army dental work has done to emphasize the value of dental services to the public. Our public schools are wasting a great deal of money which might be saved by proper sanitary conditions.

Dr. Proctor K. Brown, Milton—I think a careful consideration of free medical dispensary service will convince us that we ought to stop and turn back from this free dental hospital business before it is too late. It will be a great deal better for the members of this society. Already this has taken a great deal of money from the dentists. At one time there were no hospitals and free dispensaries. In the State of Massachusetts the laboring classes are generally earning large wages and should pay for their den-

tal work. The average net profits of dentists throughout the State are not large and we are not called upon to make this sacrifice. I consider this work will damage me from \$300 to \$400. Many of the dentists among us are not wealthy, and work taken away from them lessens the opportunity for social and vacation enjoyment. Where a clinic is started many who could pay will take advantage of us to go there. I suppose if you gentlemen want these clinics they will come. But I do not think it fair to start anything that will work to the financial injury of the rank and file of the dental profession.

Dr. H. C. Meriam, Salem—Look at a child who cannot chew or masticate his food. Into that life we are working to bring a larger opening. I remember reading in a paper years ago that the loss of health and thought was incalculable from bad teeth. We must be our brother's keeper to help or destroy. I remember Dr. Eliot stating that you would be astonished to see what a dirty mouth might be found behind a fair face. This question does not deal entirely with the poor. An analysis of the air in a sweat shop, a tenement house and a Pullman train showed that the Pullman train had the worst. It has been my practice before my patients passed from my knowledge to instruct them about these matters. With some of the poorer people I would quickly cut away some of the decayed surface of the molars and prevent decay by the use of silver nitrate. It was astonishing how long teeth treated this way remained useful. For some years I have been telling my patients of some of the uses of sodium perborate. Now I tell them to keep their mouths clean for the sake of their children also.

Dr. Belyea—There is a certain danger of injuring the financial condition of the dentist by this hospital work unless carefully safeguarded; yet nothing that the profession has ever done has helped the reputation of the profession as this has. There is nothing that will help dentistry so much as advertisement of this sort.

Dr. James H. Daly—I hope we can see next year how far this little candle throws its beams. A well-known Chelsea teacher said that he could prove that there were ten thousand people there who had never had a bath. A gentleman stated that there were thirty-five thousand in the northwestern part of the city. The

chances are ten to one that these private homes have no bath tubs or that there are four flights up and are filled up with coal. This goes to show how much is to be done for sanitation. I trust you will get your hospitals and I hope you will.

Dr. Belyea—There are safeguards in Lynn so that those who ought not to get free work will not get it. The financial condition of all the patients will be looked into to avoid complaint of this sort.

Dr. Hosley—I have considered Dr. Brown's figures and I say that the dental profession of Massachusetts can afford to give \$50,000 to advertise dentistry. I say that dentists are losing money because they are not supporting a movement for the education of the people. The more the public is educated about the value of teeth from an economic standpoint the more work there will be for the dental profession.

Dr. Flanagan—The field has been so well covered that I can add very little. Consider the amount of interest that has been started in dentistry by this movement along these lines. No more than five years ago it was a common thing to have physicians thinking that there was no such thing as real worth in oral prophylaxis in dentistry. These things have come in the last five years so that we have approached the time when dentistry can be considered something other than a repairing of structural injuries. We have inculcated in the patient an idea of the value of the teeth. A few years ago surgical operators learned to put masks on their own mouths, etc., so that they would not blow their breath into the cut; now they are also putting the mouth of the patient in condition so as to prevent infection. Now I can name a hospital in Massachusetts where the dentist is called upon to remove calculus from the mouth of a patient about to undergo an operation. But how much better for us to call attention to the fact that we belong to a calling that is humane and that is doing all it can to improve the condition of the teeth of all the people. Now medicine has been given a great deal of recognition for writing prescriptions and doing charitable work. Now the people of Springfield are beginning to ask how much the dentists are doing for charity outside of their offices. A person says, perhaps, "Dr. Jones, you are writing me a prescription for glasses; how much are you giving us in the way of glasses or spectacles?" The

dentist may take an hour to fill two teeth, while the physician can see a great many patients in that time without having to undergo the expense of materials, etc., which the dentist did.

Now as to the question of losing practice. Now we dentists have inculcated in the minds of the people that we simply repair teeth. It is time to set a new standard and also to stop recommending nostrums. If we knew bacteria and bacteriology we could demonstrate what we say. We can destroy a certain amount of bacteria by the use of mouth washes and that is all.

Motion. That the Massachusetts Dental Society appoint a Committee on Oral Hygiene to co-operate with the Committee on Oral Hygiene of the National Dental Association. The number to be determined and the members to be appointed by the president.

Dr. Lindstrom—What has the National Dental Association ever done along this line? The Massachusetts Dental Society has a record of achievement. The National has not yet done anything.

Dr. White—It is not a question of what the National Dental Association has done but of what it will do. I believe strength lies in numbers. The Massachusetts Hygienic Council cannot advance this work throughout the whole country.

Dr. Lindstrom—Are you going to discharge the present committee or include it in the new. The committee has done an enormous amount of good in the work. My intention was not to decry any work done by the Massachusetts Council and I will be willing to have the present committee appoint a committee to act in conjunction with the National.

Dr. Meriam—What is the condition of the various State societies throughout the country? What is their relation to the various scientific preparations in dentistry? Can we treat conditions in a scientific way when we treat with secret nostrums. Where did we get any support from the National in this work? We want scientific men to deal with conditions in a scientific way.

Dr. White—Does Dr. Meriam mean to call the members of the National Dental Association quacks?

Dr. Meriam—Certainly if they are acting like quacks. Quacks are pretenders to knowledge they do not have.

Dr. Flanagan—I have a great respect for Dr. White and I

want to give him recognition for his work but—an organization that has done nothing has no right to ask an organization to co-operate with it, that has already by itself achieved much.

Dr. Lindstrom—In closing this discussion I have very little to add. I might say something about the work the various local societies are doing along the line of oral hygiene. The committee has been accused of being narrow. In starting this work one has to go slow. Since this committee has been in existence, and this has been a short time only. Dr. Kirk has stated in an editorial of the *Cosmos* that nothing in the last twenty-five years has done so much to advance dentistry as the meeting held under its auspices a few months ago. We have done a whole lot of work. No doubt the committee of the Massachusetts will be glad to join the National Committee as soon as it has done any work. But I think it would be wrong to appoint a new committee and ignore the work done by the existing one. In Lynn every school child is receiving a copy of a pamphlet furnished by the Lynn Hygienic Council. Yet another feature which we are establishing is to get our secretary, who is a Radcliffe College girl and who has been two years in the School of Social Workers in Boston, to enter all the class rooms in Lynn and speak ten minutes on Oral Hygiene. We have found that the tooth brush is unknown to most of the children who come in. Those who have tooth brushes often share them with five or six others.

Dr. Paul White, Boston—I have nothing to add to my remarks. I wish to thank you all for your attention and for the interest which the Massachusetts dentists are taking in the spread of knowledge among dental lines among all the people.

The previous motion by Dr. Daley to appoint a new committee to confer with the Committee on Oral Hygiene of the National Dental Association was voted not carried as the consensus of opinion was that the Massachusetts Dental Society was already doing its part in this work.

"THE DENTIST'S NEGLECTED MIDDLE THIRD."

BY JOHN WARREN ACHORN, M. D.

There was a time when our ancestors could eat anything in sight, for they lived like any other plant, vegetable or animal, in the open air. Their diet was a simple but sustaining one. The foods they ate grew on the land they tilled. In a word, they were farmers, or if not, their work had some bodily activity connected with it of the physical, strengthening sort; they all spent some portion of their time in the open air in contact with the ground. We professionals of to-day, in comparison, do standstill work stived up in a room somewhere, and we look out upon the world through a hole in the wall. We use our head and our legs but neglect the great middle third of our bodies lying between the collar bones and the hips, where the vital processes of digestion and assimilation are going on and without the aid of which we could not work at all.

Is it any wonder, in view of all the changes to which we have been subjected, in view of the innumerable things we are doing in a hurry, the foods we are eating in a hurry, brought from all parts of the world and cooked in all sorts of ways, that our digestion fails, that we get out of tune or out of proportion and find ourselves troubled with some chronic ailment, the result of misfit food, waste in the system or something worse?

Many people eat seven things in the right amount and in the right way, but the Lord only knows what they will do, when it comes to the eighth thing, that thing they like in particular, that has seven inches of taste in it and twenty-three feet of stomach ache on the other side of the neck-tie for solution afterwards. Again, one person may eat with impunity a certain food, for him there is nothing indigestible about it; his neighbor, looking on, thinks he can do the same thing. The remark, "Oh, that won't hurt you," is a great misery maker. What we can eat with impunity at twenty is not necessarily the food that fits best at forty. Food must be modified to meet the indications incident to age and occupation.

Most of us go on eating and drinking and doing things we learned to do unconsciously as children, or acquired in some other thoughtless way without regard to the after effects, never once seriously asking ourselves whether as individuals this is the

right thing for us, in view of what we may be doing until some fine morning disorder drives us to consult a doctor, and we find we are in for it, with no better reason or excuse than this: that we have taken too much for granted.

We carry the habits of childhood into old age so far as eating goes but in almost nothing else.

Sugar is the natural food for children with their quick digestion and quicker activities. Children need quick energy and sugar furnishes it. A child's stomach empties in two hours, the stomach of a mature man or woman empties in six hours. Sugar except in limited amounts is not suited to advanced years and sedentary habits.

If water were the only food required, other things being equal, every one's health would be as good as every other one's. It would be easy to see how many "eat their troubles," aside from those they borrow worrying about themselves or their neighbors. But things never are equal in this world, and this is as true of eating as of other things. What is the difference between what this or that one eats or drinks that makes this one fat and this one lean, etc., this one anaemic and that rheumatic, this one bilious and that one have chronic bronchitis. Preventive methods are what we ought to practice and preventive medicine is the only true way to practice the art, but here in America the cart goes before the horse, and we go to the doctor afterwards.

The Roman soldiers 500 years before the Christian era, in the time of Hippocrates, lived on one meal a day. Two hundred years after the Christian era Celsus, another physician known to fame, said, "It mattered little whether a man ate one or two meals a day." One hundred and fifty years after Celsus' time, some of the nations of the world, as the English, were eating four or five meals a day. The British soldiers during the Boer war lived sometimes on one meal a day, with coffee in the morning. The Japanese soldiers lived chiefly on rice and fish. We eat or should eat just the amount of food necessary to keep the blood in good condition, for the blood goes everywhere and nourishes all the tissues.

It has recently been demonstrated beyond dispute that one and a half pounds of mixed food a day, as it comes to the table, *if properly eaten*, will sustain a man weighing 165 pounds, at

hard labor. This would be represented by an egg, chop or moderate slice of roast beef (10 ounces), by a baked potato, saucer of peas, a few lettuce leaves or slices of tomato (7 ounces), by two or three apples or other fruit equivalent (6 ounces), by half a loaf of bread, six slices (6 ounces), butter (1 ounce)—approximately two pounds. The old estimate of three pounds a day is undoubtedly in excess of physiologic requirements under ordinary forms of stress.

The normal stomach holds about three pints. Many stomachs hold less. The stomach does not absorb liquids, it is not elastic. Liquids habitually used in excess *with meals* weaken the muscular power of the organ and dilute the gastric juices. In view of these facts, not more than one glass of liquid should be taken with meals, and little or none when soup is indulged in. Four hours after a meal, or one hour before meals, is the best time to drink water freely. Liquid nourishment, taken between meals before the stomach is empty, usually disturbs digestion. It should always be thin in character, something that will not take away appetite for the next meal, as solid food is prone to do. The pernicious practice of taking iced semi-solid food between meals and repeating the dose in an hour or two, or when again thirsty, and the next soda fountain is reached, cannot be too earnestly condemned. This practice brings on chronic catarrh of the stomach. Ice water checks the flow of saliva in the mouth, and should be avoided especially when one is eating starchy food. Ice cream should be eaten slowly that it may become warmed up in the mouth before it is swallowed.

The salivary glands in the mouth stop secreting saliva, in part at least, if food in the stomach is moistened by the constant sipping of some liquid. Everything in this world is just as lazy as it dares to be.

The normal stomach empties itself in six hours, depending somewhat upon the meal. Three meals a day, as usually taken, do not allow time for this, at least, among brain workers, in view of their sedentary life, with much of the nervous force, that should be helping digestion along, diverted into other channels when no movements of the body are made, in many instances, sufficient to hasten the lymphatic circulation and blood currents about the stomach and other digestive organs, or to help the stomach empty itself.

There is a vast blood and lymphatic circulation in and about the stomach, liver and intestines where the work of digestion, assimilation of food and metabolism are going on. The lymphatic circulation for the whole body amounts to forty pints, while the amount of blood in circulation amounts to eighteen pints. The lymphatic circulation, through and about the stomach, liver and intestines is probably equal to all the blood in the body. From this comparison we can see how important it is to keep the blood and lymphatic currents about the digestive organs actively in motion.

Our teeth are in our mouths and not in our stomachs, but many people seem to have forgotten this fact. The crushing power of the jaws is 500 pounds, while the stomach has only limited muscular energy. Food must be thoroughly eaten if it is to be fully assimilated. The amount of nervous force saved when food is properly eaten may equal the amount of energy expended or used by the brain in its daily round of work. It takes energy and lots of it, for the stomach and intestines to free themselves of beans, hash or orange peel swallowed whole, day after day.

When we realize that three hours of mental labor are equal to eight of physical, and that most brain workers do twice any ordinary man's work each day, under conditions directly antagonistic to physical well being, it becomes us to take into our confidence such measures for our protection as are within our reach. There is a law in this State that denies ordinary labor the right to work over ten hours a day; as a matter of protection, there ought to be a law applicable to brain workers, for the same reason and even more so. The daily task of a man at ordinary labor with a pick and shovel, is a hole in the ground; and he works just hard enough to promote digestion and keep himself in the pink of condition, he was never known to do more than that, and yet he is protected by law, while we mentals past forty, with something to do, often work ten hours a day without any physical exercise worthy the name, stived up in some room where we look out upon the world through a hole in the wall, instead of deriving the benefit that comes from digging one.

Food, when not properly prepared in the mouth, is swallowed in chunks and the stomach, in time, after two or three hours, exhausts itself trying to triturate or get rid of it, and this is especially

true of those whose stomachs are held at a standstill, because of the nature of their work and the further fact that only half the nervous force to which the stomach is entitled, when it has a big job on its hands, as is usually the case, after hurried eating and much drinking, is available.

Nothing is more wholesome than the hearty appetite of a healthy man under self control, and nothing more pleasing than the sight of a graceful woman eating daintily. Compare this picture with the average guest at a lunch counter. A hen eating hot corn meal does much the same as one of these guzzlers. She hurriedly gobbles down from every available pile all she can hold and then runs around with her mouth open trying to cool off. A hen has just as little sense.

The stomach of a hustling American resents being used as a waste basket. A sound stomach in a man past forty years of age is hard to find.

It is a good plan for brain workers to go without food during the hours of greatest mental activity, if there is any weakness of digestion or loss of general nervous force as is usually the case with those who are not strong and the exhausting work of the day progresses, or as is often the way of it, with the best of us, toward the end of each working year. If nourishment is taken it should be small in quantity and easy of digestion; and it were better all solid or all liquid. Each pint of liquid (two glasses) whether soup, water or beer, weighs a pound or more and when we consider that more often four glasses of liquid than two, are poured into the stomach weighing the organ down and diluting the gastric juices, is it any wonder that digestion fails and that the stomach loses its muscular power trying to triturate particles of solid food, in a liquid medium that is always dodging its grasp. This same meal taken after an hour's rest or after the day's work is done, and the brain lets go, might work no mischief, but such meals taken in the middle of the working day when mental concentration and nervous tension are highest, certainly play havoc in the long run with the digestive apparatus.

Breaking away occasionally from the right rule of life and living, for each of us, as individuals, probably works no permanent ill effects, certainly not, if after such indulgences we have sense enough to "break back" and not continue them until we finally betray such health and strength as we may possess.

As the result of too much food or meals eaten too near together, one meal being put into the stomach on top of another but partly digested, or of food unfairly taken and only half masticated, the intestines become filled with the illy prepared products of imperfect digestion. These products are sucked up and enter the blood current, rendering it impure. In turn these products congest the connective tissues all over the body, the system becomes clogged and the circulation retarded. Then follows in all likelihood some of the chronic disorders, from which many people in middle life suffer chronic rheumatism (so-called) due to nothing but rubbish floating in the blood current; constipation, with headache as a symptom,—chronic billiousness (so-called) where the stomach mucosa becomes congested and irritated from the character of the food taken, and the way in which it has been eaten, associated usually with splashing stomach, a bad breath and a coated tongue; depression or irritability, due to auto-intoxication, certain cells in the brain being affected by the poisons circulating in the blood and lymph; chronic bronchitis and certain forms of asthma, due to too much starchy food and sugar; constant fag and weariness complained of by men who are perfectly willing to work and would do so, if they didn't feel too mean to work. Rigg's disease in many instances arises from the ingestion of too much sugar, meat or starch, or is maintained by their use in excess of physiological requirements, especially with those who are constitutionally lithæmic. The metabolized waste of sugar and starch is eliminated by the lungs. Eaten in excess or in undue proportion by certain individuals, this waste clogs the connective tissues of the whole body, and by retarding the capillary and lymphatic circulation of the neck and head may induce chronic congestion of the gums. Then the local causes in the mouth have their chance or they are aggravated by the systematic condition. Meat helps the trouble along, by the fermentation its acids set up in combination with sugar, and again because of its tendency to putrefaction in the small intestines. Boiled meats are safest in the rheumatic. Which of these foods is most at fault can only be determined by trial; it takes six months usually to demonstrate a case. The use of water on an empty stomach should not be lost sight of when cleansing the system of these waste products.

Probably no class of professional men have a greater strain

put upon their nervous systems and upon their digestive apparatus than do dentists, in view of the standstill character of their work. They are called upon to assume and maintain attitudes for hours at a time because of the delicacy of their manipulations, that are almost motionless. Then the constant drain that the sympathetic character of their work makes upon their nervous systems influences digestion greatly.

LUNCHEES.

IN THE OFFICE.

(1) Rusks, zwieback or bread crusts, with butter, French prunes and a glass of milk or water.

(2) Cold slaw, with olive oil and powdered sugar. Bread and butter.

(3) Sliced banana sprinkled with sugar, and sprayed with lemon juice. Bent's water crackers toasted until brittle.

(4) Norwegian sardines with crackers.

(5) Ripe brown olives with crackers.

(6) Raw celery with French bread and butter.

(7) Canteloupe with bread and butter.

(8) Raw sliced tomatoes with powdered sugar.

(9) Raw ripe apples with soup sticks and butter, milk and vichy.

(10) A bottle of Matzoon or Lactated milk.

AT THE LUNCH COUNTERS.

(1) Breast of chicken, toasted soda crackers, butter, water.

(2) Any fresh fine-fibre fish, boiled or broiled, such as cod, haddock, flounder, butter fish, with bread or potato, butter.

(3) A small portion of some soup with rye or graham bread. Some vegetable.

(4) Oysters raw with lemon juice or salt and pepper. Bread crusts, butter.

The frying pan arrived here in 1492. Fried food has worked more misery than alcohol.

The New England people are still in love with it and in the South, where the darkey mind rules the kitchen, it is supreme. They even fry their water down South. Fat is not acted upon in the stomach. Frying the fat hardens the fat globules. Fat fried onto the outside of starchy food such as hominy or mush, hinders the digestive action of the saliva, not only in the mouth but in the

stomach, during forty minutes, when hydrochloric acid is secreted and that ends the starch digestion for that meal in that organ.

The real benefit of any food eaten, is not experienced, until several hours after it is taken; it has to be digested and assimilated first. What we satisfy at noon time quite as often as hunger is the mental wish for food. A cup of tea or a tablespoonful of olive oil in orange juice will do this, or a raw egg in Moxie and a handful of peanuts. The moment any food reaches the stomach, its presence is reported back over the sympathetic nerves to the brain and the wish being satisfied, the desire for food vanishes. Again, this desire is a body habit, and is easily overcome by ignoring it when necessary. In a short time the desire is no longer experienced.

The difference between relish and hunger should be recognized.

Desserts satisfy relish more often than hunger; they are a snare and a delusion and lead one to eat food in excess, to their detriment mentally and physically. For this reason I have omitted any discussion of them.

DISCUSSION OF DR. ACHORN'S PAPER.

Dr. George H. Wright—I must express my appreciation for this very carefully prepared and interesting paper. We will all carry away many valuable ideas. I have been conscious that the maximum amount of work can be obtained from a minimum amount of food. Whenever I eat a hearty luncheon I am sure to have no brain power in the afternoon. The doctor has given us a very practical subject which might help us in our pyorrhetic conditions, that is, in a consideration of the dietary of the individual. If we wish the patient to get well we must insist upon his hearty co-operation. There is very little use in careful instrumentation, if the patient does not co-operate by ceasing to fill his system with unnecessary food. A load is thrown on the whole system in an effort to eliminate the excess. The doctor has suggested that there are forty pints of lymphatic circulation, eighteen pints of which are around the stomach and intestines. If there is stasis of the lymphatic circulation in any part there is bound to be an inequality in another part. If the circulation is charged with waste you may be sure that the peridental membrane and

the dental pulp are going to share in it for added to that you have accumulations of the pyorrhetic pus. The body is bound to show, not only the disturbed conditions in digestion, but also congestion about the gums which we are so familiar with. I am sure many here have many points of interest to offer. I thank you for this paper.

Dr. Ned Stanley—I believe every man should have a hobby to which he can turn for relief. The time may come when he may be incapacitated for his daily occupation.

Dr. M. C. Smith, Lynn—I have got to express my utter inability to discuss this paper. I am laboring under extreme disability caused by a full stomach. I can agree with the essayist in all his remarks of to-day. Lately I have come to believe I am eating too much. I feel that as age comes along I have got to eat less. This habit of eating is about all we can call it. Get up in the morning, fill the stomach with this overload, then go to a lodge in the evening. Is it any wonder that we call it the abused middle third?

Dr. Meriam, Salem—As dentists, we recognize the incapacity to change conditions under which we work. We have a certain number of hours in which we may work and a certain number of hours in which we may recreate. For the past year I have been under a doctor's care and have had sermons not so wittily given. It is a strange thing that many who have apparently defied the laws of exercise and health do live so long a life.

Dr. Flanagan—The doctor has spoken of the question of hobbies and I am going to speak of hobbies. There are good hobbies and there are bad ones. There are some dentists that are so good natured and so full of human kindness and fun that they are never at a want for recreation. The more a man plays the stock market the more he will worry.

The Franklin Syndicate of St. Louis had heading its list of what are known as suckers, the names of dentists. They were ninety-seven per cent. strong. Next were the physicians, next the legal profession. Dentists worry because there comes a time when the dentist's earning capacity has ceased. Ninety-five per cent. of business men fail sooner or later. In the profession we have something to think about. Many a man in dentistry has been his best at forty-five. We should have a hobby. When mak-

ing investments consult a banker. Too many of us take up these things without consulting a banker because we fear he will not give us the opinion we are looking for. If the profession is to save anything we should have attached to the dental college a chair on conducting a business so that we all may save for the comfort of our old age and the support of our family.

Dr. Frederic Freeman—One thing in the essayist's paper interested me greatly; that is the development of the muscles of the abdomen. This will cure anybody of constipation. The simple movements of the muscles back and forth will help indigestion more than anything else in this world.

Now speaking of hobbies. I do not think Dr. Smith has got half as many hobbies as I have. For instance, some time ago I struck the stock market and went down and out.

During the last five years I have made more money outside of dentistry than in it.

I was sick last winter, laid up three months with nervousness. It was not worry that caused it. It was a nervous breakdown, the result of hard work in dentistry. The reaction of hard work out of doors last summer brought it on. As for hobbies and the talk of Dr. Achorn about the growing of fruit and the raising of live stock I can say, thus far, that I have found them to have nothing on cranberry raising.

Dr. Achorn, closing the discussion—I have nothing to add of much consequence. I shall add only a talk on hobbies. I am a saturated solution of them. A hobby should always be something that makes a material return to the man for something that he puts out. A man who has worked and secured returns for his labor all his life is not going to be satisfied to work hard on his hobby without getting some tangible returns for his labor.

The next order of business was the reading of a paper by Geo. C. Ainsworth, D.D.S., on "The Inclined Plane for Jumping the Bite and Adjusting the Occlusion," as follows:

SELF ACTING OR AUTOMATIC APPLIANCES IN ORTHODONTIA.

Illustrated by Stereopticon.

GEO. C. AINSWORTH, D. D. S., BOSTON, MASS.

My purpose this evening is to show you two appliances which I have been using during the past six or eight years with a great deal of satisfaction, both of which I have exhibited and demonstrated at various times and places, therefore some of you are more or less familiar with them.

Yet the advantage in using these appliances seems to me so great as to justify still another repetition.

The first I have designated as an Automatic Spreading Appliance for widening the arch, while the second is an Inclined Plane for jumping the Bite and adjusting the Occlusion.

In bringing these appliances before you, I am not promulgating a new system of orthodontia, but rather bringing to your attention a new application of old principles, so simple that I wonder they have not long ago been applied to accomplish that part of the work for which they are designed.

I think it will be readily admitted by all who have given the subject a little thought, that a very large percentage of cases of malocclusion require a spreading of the arch as a preliminary to the proper alignment of the teeth.

We will first take up the consideration of the Automatic Spreading Appliance, which may have a double action, i. e., it can be so adjusted as to spread the arch, and when desirable, retract the incisors at the same time, or by the addition of ligatures, the front teeth may be moved forward or elongated.

In accomplishing the first two it is entirely self-acting and requires very little attention, allowing the absence of the patient, two, four, or even eight weeks at a time, yet its action is under the control of the patient at all times.

In the second instance, where ligatures are employed, it requires closer attention, but when wire ligatures are used even those allow the absence of the patient several days.

Picture No. 1—This appliance in its simplest form, is composed of three members—two anchors and a wire spring, while the compound form has two springs. Each anchor is made up of three pieces—a piece of seamless tubing with 30-gauge walls, of suitable size and length to be fitted to the tooth chosen for anchorage, after the manner of forming a band for a gold crown. To this is soldered on the palatal side and at right angles with the band, a piece of 16-gauge wire running along the border of the arch with a bearing on and of sufficient length to engage all of the teeth to be moved on that side; while on the buccal side of the anchor band is soldered a short piece of 16-gauge seamless tubing running parallel with the band, to receive the end of the spring wire—the active principle of the appliance. These anchors when completed, are adjusted to the teeth selected, and cemented firmly (No. 2) into place, one on either side of the arch, after which the two ends of the spring wire are bent at right angles to itself, and with a sort of U-turn in the wire (No. 3) to admit of a certain amount of adjustment, are sprung into the tube provided for them. The inside bar is designed to move laterally the bicuspid and molars, as a unit, without the aid of ligatures.

This case seems to be an unusually favorable one for this appliance, which in its operation has a double action. (No. 4) The sides of the arch are to be equally expanded and the incisors moved in. The teeth to be moved out include the cuspids, the bicuspid and first molars. The spring being adjusted to bear firmly on the labial surface of the incisors presses those teeth in, as the side teeth move out. The teeth chosen for attaching the anchor bands should be midway between the two points of resistance, (No. 5) and this perhaps more often falls on the first bicuspid than otherwise, though sometimes it may be the second bicuspid, or even the first molar.

My estimate of the central point of resistance in this case, is the first bicuspid, the cuspid and first molar being the extreme points. You will readily see that if the pressure is applied in the molar region, it would not expand the arch at the cuspid, which tooth offers marked resistance. If, however, during the operation you find your judgment has been in error for any reason, it is not a difficult matter to change the attachment to a more favorable location.

The time required to accomplish the desired change depends

upon the age of the patient and the adjustment of the spring. I should not hesitate to dismiss this patient for two months after adjusting the appliance, but where convenient I would look at it about once in two weeks, always directing that if anything seems wrong, or soreness develops to report at once. The spring, as you see, can be readily removed and readjusted by the patient.

This picture shows another case for the simple appliance. All the teeth seem in satisfactory relation, excepting the second (No. 6) upper bicuspid on the right side which occludes inside the arch.

The appliance was adjusted here to pit the resistance (No. 7) of the five teeth on the left—all the teeth from the cuspid to the second molar—against the resistance of the one displaced tooth on the right.

In eight weeks the tooth had moved to the position as you now see it, with practically no attention or change and, if I may (No. 8) believe the patient, without any pain or inconvenience whatever. Undoubtedly had the tooth not been locked in by the approximating teeth, it would have moved to position in half the time. The small wire on the inside was put on as a precaution, lest the tooth should start suddenly when it had progressed far enough to throw off the lateral resistance, and come out too far, in which case you can readily see that the small wire would bring up against the palatal surfaces of the bicuspid and molar, acting as a check. On the completion of the movement the appliance was removed and a retainer consisting of a simple band cemented to the tooth, to the buccal side of which was soldered a piece of gold wire, similar to the one shown on the palatal side, the ends of which rested against the buccal surfaces of the approximating teeth.

The next picture shows a case where the simple appliance (No. 9) would be appropriate, but where I should choose the second bicuspid for anchorage of the bands, placing the spring wire tubes at the mesio-buccal surface.

The next picture shows a case of rather narrow arch and having a large "over bite" when placed in contact with the lower.

The appliance as shown was placed on this case March 18th, and after two visits was taken off June 5th, and an inclined plane appliance adjusted to correct the "over bite." The case is progressing finely with visits from two to four weeks apart.

The next, a similar case: Automatic Spreader put on November 21st, and the Inclined Plane substituted March 1st.

No. 11—Of course there is nothing remarkable in what is being accomplished in these cases excepting the satisfaction of seeing them progress so favorably without laborious and painful attention. The gums are clean, healthy, and comparatively free from irritation.

It is perfectly practicable with this appliance to carry both upper and lower along simultaneously, sometimes a matter of much importance, since it lessens the number of visits and expedites the work. Indeed there are many cases where inconvenience and discomfort are lessened by having the upper and lower carried on together.

This picture represents the teeth of a lady forty-five years of age and introduces the addition of another spring (No. 12) wire and its attachment to the simple appliance, making a compound, self-acting appliance which is applicable to those cases where *much* pressure is required at both the cuspid and molar region. The longer spring, acting on the molars, may be adjusted high up under the lip entirely out of sight; while the shorter one, acting on the cuspids, may be adjusted lower down at the pleasure of the operator.

No. 13—All the teeth are present excepting the lower second molar on the right, and the four wisdom teeth. The upper bicuspids and molars occlude inside the arch, the front teeth are badly bunched, giving to the mouth a decidedly unpleasant expression, the lips closing over them with difficulty. The lower arch is of normal width, but the teeth are somewhat out of position in the left cuspid region, that tooth being perhaps 1-16 of an inch short.

The appliance was put on this case in June, and if I remember correctly, I saw the patient three times before August vacation. On her return in September, I found the arch widened at the molar region fully one-half inch, with the assurance from the patient that she had suffered no inconvenience whatever; in fact, she said she could not believe for a long time that it was accomplishing anything, it was so comfortable.

You will observe that the tubes on the molars run high up opposite the ends of the roots. (See No. 12.) This was for the purpose of applying the expanding pressure in such a way as to move the roots and process at that point, the long ends of the

spring wire being bent at such an angle as to apply *force* there when inserted in the tubes. It is perfectly practicable to insert the wire the other way, i. e., at the top of the tubes and thus apply the force high up, (No. 14) overcoming the tipping tendency sometimes met with in other appliances.

MAKING THESE APPLIANCES.

In making these appliances German silver or gold may be used either from plate or seamless tubing. The walls of the anchor bands should be 30 to 32-guage (B. & S.), while the small tubes may be 30-guage. The spring wire may be either 18 per cent. nickel, German silver or platinized gold—16 gauge. The materials in German silver may be obtained from the Blue Island Specialty Co., of Blue Island, Illinois, or platinized gold wire and 22K Seamless Gold Collars of the Dental Supply houses.

When made of German silver, the appliance should be nicely gold-plated before placing in position in the mouth.

The method of procedure in making the appliances is as follows:

Having selected tubes of proper size for the anchor bands, anneal them and with a pair of contouring pliers proceed to form each into a sort of barrel-shaped cylinder, then with the plate shears cut away a part of one end to approximately correspond to the gum line around the tooth; then gradually work it up into position, perhaps a little under the gum, take an instrument and mark around at the gum line; also at the coronal end, so that there shall be a small projection left after trimming to turn over the edge of the tooth into the sulci, giving the band a firm seat when finally cemented to place; after the trimming, the two bands are placed in position and a *plaster* impression taken. This, in my judgment, is important, as accuracy counts for much when one comes to set the appliance.

As a rule, it is reasonably possible to force a band of 30-gauge walls between the teeth, but sometimes as an aid, I draw in some sort of a wedge for fifteen minutes, or an hour, as the case may be. A rubber wedge works well for that length of time. Then again, the edges of the band may be thinned a little and smeared with cocoa butter;—one band may be crowded in a trifle and left while proceeding with the other. In short, a variety

of expedients may be resorted to that will be suggested to the mind of the resourceful man.

After the impression has been removed from the mouth, the bands are carefully taken off, the inner sides coated with wax so that they can readily be removed from the model later. They are then replaced in the impression when the usual detail of making the model is gone through with, the bands appearing on it exactly as they will stand in the mouth. Next, with a good sized cross-cut fissure bur, channel the buccal side of the band where the small perpendicular tube is to be attached, remove the band from the model and holding with a small pair of tweezers solder the tube to the anchor band, and return to place on the model. Proceed then to adjust the palatal wires to fit the model as desired, being *particularly* careful if intending to move the cuspids out, to turn that end of the wire well up under the gum in such a way as to engage that tooth above the bulge of enamel; otherwise, when the spring pressure is applied that end of the wire will slide down the incline plane surface of the cuspid, instead of moving the tooth, resulting in a troublesome elongation of the tooth banded.

When these wires have been properly fitted, hold them in position by pieces of binding wire passed around them and through the model, twisting the ends till taut, and proceed to the soldering, which is done on the model with hard solder.

The next step is to remove, finish, polish, and gold plate.

The labial spring wire is usually fitted into position after the anchors are placed in the mouth, sometimes before cementing, sometimes after. If the front teeth are to be moved in and spaces closed up, the wire is adjusted to bear as firmly as possible on those teeth; if the front teeth are to be moved out, the wire is adjusted to stand out a bit to admit of the ligatures doing their work. Under favorable conditions, the fitting of the anchor bands and taking the impression can be accomplished in an hour.

PLATING PLANT.

Some sort of a gold plating plant seems an important auxiliary to the dental equipment of to-day.

A simple one is made up of a glass pickle jar of convenient size with a cover to prevent evaporation and exclude dust, containing a fluid composed of

30 grains Chloride of Gold, (Merck, U. S. P.)

60 grains Cyanide of Potassium, and
 $\frac{1}{2}$ pint of Distilled Water,

operated by a single cell Sampson battery. A piece of pure gold is attached to the carbon wire and suspended in the fluid, while the article to be plated is attached to the zinc wire and likewise suspended, care being taken that the gold and the article to be plated do not come in contact while in the solution.

In place of the Sampson cell the wires may be connected with the ordinary electric lighting supply, in which case the current is run through a series of lamps to reduce it.

In the latter case, the piece to be plated is left in the solution perhaps five minutes, when it is taken out and polished; this process is repeated several times according to the amount of plate desired. Placing the jar of solution in a hot water bath facilitates the work.

ADVANTAGES.

In summing up the advantages of this appliance, its *simplicity* seems to stand out as a keynote far and above any thing heretofore in use.

Being simple, it is *cleanly*, doing away largely with ligatures, *always painful to apply and uncomfortable to wear*.

It is *effective* because it is worn twenty-four hours every day, and the power is applied directly to the teeth to be moved. It interferes as little as possible with the ordinary functions of the teeth and mouth, besides minimizing the deleterious effect sometimes noticed from wearing a more complicated appliance.

It is automatic in its work, and may be adjusted so as to have a double, or by the addition of ligatures, a triple action, i. e., it will spread the arch, move the front teeth in, and elongate at the same time.

As it is automatic in its action, it requires less attention and consequently produces less inconvenience and pain, which should lend value to our services.

THE INCLINED PLANE.

The second appliance which I shall now show is an Inclined Plane fixed to the teeth, used for "jumping the bite," and adjusting the occlusion.

We are frequently confronted with cases of abnormal "over

bite," with or without distal occlusion, wherein the discrepancy in length between the lower incisors and the bicuspid and molars is considerable. (No. 16B.) Not infrequently do we find the lower incisors striking against the rugae of the palate and the distal teeth too short, while the upper incisors protrude and close out over the lower lip, causing a most unhappy vacant expression.

And again, during the process of regulating, we often find difficulty in establishing a perfect register of the mesial line (upper with the lower) as well as a correct mesio-distal relation of the buccal teeth. There seems to be two or more closures equally comfortable. It then becomes a question of compelling one, and only one closure, in order to give the teeth an opportunity to adjust themselves to each other according to nature's design.

The picture now on the screen shows such a case. After the upper teeth had been brought into an approximately correct arch relation, an attempt was made to establish a (No. 17) correct occlusion (just as the twelfth year molars were erupting), by constructing gold crowns for the upper sixth year molars with grinding surfaces corresponding to those on the lower teeth when in correct occlusion and allowing the twelfth year molars to erupt into their proper relation. Thus far everything seemed satisfactory, but the gold crowns being removed, observe what happened. The patient instead of adopting the correct occlusion, just shown in the last picture, found the one now on the screen (No. 18) more agreeable and effective, thus defeating the attempt to correct the "over bite."

The obvious objection to an inclined plane in connection with a plate, led to the application of the same principle involved (No. 19) in a plane soldered to bands encircling the upper centrals and to lugs, engaging the cutting edges of the laterals, to prevent depression of the centrals. This resulted in establishing the correct occlusion now shown.

This appliance may seem at first an uncomfortable one to wear, but this young man affirms that after the first day or two he paid no attention to it, and like reports come from similar cases.

This was the first appliance of the kind which I made. I now have them made with bands around the laterals as well as the centrals, as more cleanly and less likely to injure the teeth.

The bands cover nearly the whole palatal surfaces of the teeth and are firmly cemented on. The inclined plane surface is made from about 24-guage platinized gold plate.

The next picture shows a case of very common occurrence wherein the "over bite" is considerable. (No. 21) The lower teeth are somewhat distal to normal, and when the upper and lower incisors are placed in normal relation, the back teeth are perhaps three-sixteenths of an inch too short.

It is perfectly evident that so long as this boy can close his teeth in this relation, the bicuspid and molars will never elongate to a perfect occlusion and give a harmonious expression to the face. (No. 22) The relation of all the teeth is very good indeed excepting the "over bite" and the one in-standing upper lateral incisor. Under ordinary circumstances the teeth to which the plane is to be attached should be put in their proper position before attaching the appliance, but, as in this case, the boy was to be sent away to boarding school where it would be exceedingly difficult for me to see him for six months, I adjusted the appliance as shown in this picture January 7th, leaving the lateral to be corrected at a later date.

The next slide shows the case as it returned to me July 8th, six months later. (No. 23) The plane was removed the following October, and an ordinary arch band adjusted to bring the lateral into position.

The next picture shows a somewhat similar case, (No. 21) but where the upper incisors hook in, while the upper cuspids turn outward distally, and the "over bite" is such as to nearly exclude the lower front teeth from view. In this case the upper teeth were placed in proper relation to each other, the cuspids rotated and an inclined plane adjusted with bands around the cuspids to retain them after the rotation. The plane was worn for about a year when it was removed and impressions taken for the models as shown in the next picture. (No. 25) You will observe that the occlusion is now practically perfect.

MAKING THE INCLINED PLANE.

Before making the Inclined Plane it is always best to place the teeth to which it is to be anchored, usually the four upper incisors, in as perfect arch relation as possible. Sometimes, however, I have used the cuspids and laterals, and again, where the

arch has been widened, or the front teeth moved in, additional bands may be placed on the second bicuspid, to which can be soldered a platinized gold wire running round the arch palatally, thus incorporating the feature of a retaining appliance. Indeed, I have often made use of this feature to still further widen the arch in the molar region.

We next proceed to make bands for the teeth chosen for anchorage, using 22 K. gold of 30 to 32-guage. Where it has been necessary to move the teeth much, it is well to have anticipated their soreness, and fitted the bands before they were moved and laid them aside till wanted. It is well to make them wide enough to cover the entire palatal surfaces as being more secure and offering greater protection from injury to the teeth on account of uncleanness. When placing the bands in position, we find it advisable to thin them down a bit, where they double up approximately, as later when they are soldered together, the strength will be sufficient.

The next step is to take "the bite" by placing a roll of modeling compound, about the size of a cigar, across the mouth at about the bicuspid region, instructing the patient to close, bringing the upper and under incisor teeth into a perfect relation to each other. Remove the compound, lay it carefully aside, and proceed to take a plaster impression of the upper teeth with the bands in position. Never trust to anything but plaster for this impression. The bands are now removed from the teeth, lined with wax, and accurately placed in impression and fastened. We next take an impression of the lower; modeling compound will do for this impression. Then proceed in the usual way to obtain the models from the impressions, and by the aid of the cigar-bite roll, mount them on an articulator.

The result is bands standing on the model exactly as they did in the mouth together with the desired relation of the front upper with the front lower teeth, the back teeth being more or less apart, often as much as one-fourth of an inch.

No. 26. Let us suppose now that the upper arch has been widened and we desire to incorporate the retaining appliance feature, having gold bands encircling the second bicuspid which also now appear on the model. We proceed to adjust a 16-gauge platinized gold wire running around the arch palatally from molar to molar with a view of soldering it to each of the bands. The

wire is then held in position on the model by the aid of pieces of iron binding wire passed around it and through the model at convenient places, the ends being twisted till taut, as shown in some of the pictures.

No. 22. And now comes the adjusting of the plane proper. Having roughly made a tin pattern, we cut the desired shape from a piece of 24-gauge platinized gold plate, and by the aid of the lower model, adjust it to the bands. It must be of such a width and set at such an angle that the lower incisors when in the act of closing cannot close behind it, but must slide forward and upward along the incline and come to a rest in normal occlusion, just distal to the upper.

I find from experience that it is well to open the bite rather more than natural to allow for some settling of the bicuspid after the incline appliance is removed. Especially is this true where the bicuspid were fully erupted before the appliance was put on.

The plane now being adjusted and waxed to position, it becomes necessary to devise some means of holding it absolutely during the process of soldering. This can be done by drilling a small hole at either end of the plane through which to pass a piece of iron binding wire, which shall pass through the model and be secured by twisting the ends together. Remove the wax and proceed to solder all together on the model; when finally finished and polished, it should go to place as did Solomon's Temple.

This matter of detail may be varied to suit one's own ideas or convenience.

The whole is now to be firmly cemented into position, preferably with some good brown hydraulic cement.

Should it be desired to spread the arch more, you have but to bend the platinized gold wire so as to apply pressure against the back teeth when sprung into place.

You will observe that in my text I have avoided any attachment to the principal molars, because I wish those teeth in particular to be free to oscillate and adjust themselves to a perfect occlusion. The picture shown is from an old appliance.

In some cases it will be found necessary to make the plane quite wide to commence with, to prevent the possibility of closing the lower teeth back of it, but it will soon be found possible to

reduce the width, as a change takes place at the condyle, making it impossible to close as far back.

It is but fair to state that simultaneously with my development of this appliance, Dr. Will Davenport, of Paris, worked out practically the same thing—which he terms “A Bite Guide,” and I think a paper illustrating it was read at the Columbian Dental Congress (1905?).

The advantages of this appliance are, *first*, its simplicity—no ligatures or rubbers required. It is cleanly and effective, automatic in its action, requires no attention from either patient or operator after it is adjusted. It is not painful, and successfully meets the requirements as nothing else within my knowledge will do.

No. 27. The following case is shown, not because of its connection with any appliance presented, but for the reason that it is in some respects quite remarkable:

No. 28. The gentleman presented at the age of forty-nine. The only contact between the upper and lower teeth was on the right side, between the second molars, which, instead of meeting each other squarely, passed by each other, wearing an inclined plane on either tooth. (No. 29.) The jaws closed much beyond the normal point, giving a most unpleasant expression to the face.

No. 30. One molar and lateral are missing on the upper left side, and on the right side two molars, one bicuspid, the cuspid and lateral, seven teeth in all. In consequence, the contraction of the jaw has been such that all the upper teeth strike well inside the lower arch, the incisors fully one-half an inch.

On the lower jaw every tooth back of the first bicuspid on the left side had been extracted and the right first and second molars were also missing. The question asked by the patient was, “Can you do anything for me, or must I be turned out to pasture to die like an old horse? I cannot chew as I am.”

The models of this case were before me three months before I felt an inspiration to try a possible solution of an apparently hopeless case. Artificial plates alone were out of the question because of the great discrepancy in size of the two arches.

It was decided to attempt to widen the upper arch in order to bring the molars and bicuspid as nearly as possible over the lower, since every particle of movement in that direction would be a distinct gain; and to move the incisors as far forward as might

be to improve the appearance, though it seemed absolutely out of the question to obtain an occlusion of the incisors.

In four months the result was beyond the most sanguine expectations entertained at the start, and a temporary retainer was inserted for the summer.

No. 31. In the autumn a combined bridge and retainer in one continuous piece was made for the upper, using as abutments the molar and first bicuspid on the left side, and the molar and second bicuspid on the right, swinging the missing intervening teeth on as dummies. The missing teeth on the lower jaw were supplied on a partial gold clasp plate.

No. 32. The result is a good masticating contact on either side back of the cuspid teeth, and a reduction of the antero-posterior distance between the incisors to one-eighth of an inch.

NOTE—Since writing this paper I have obtained from Messrs. J. Briggs & Sons Co., 65 Clifford Street, Providence, R. I., what seems to me now to be a better spring wire than I have been able to obtain before. It is known as "Optical Metal," apparently has a large per cent. of copper in its make-up, and why may we not expect from its use the same preservative effect that we get in the use of Copper Amalgam. It bends as readily as platinized gold and is much more springy, though it is of no use where hard soldering is necessary as under heat it becomes very soft. Costs from 50c. to \$1.00 a pound, according to size and quantity. Gold plated, 75c. to \$1.50 per ounce.

They have also recently made up a lot of seamless German silver tubing, 32 gauge rolls; nine sizes, nesting together, suitable for anchor bands for molars and bicuspid; 6 inches each of the nine sizes, \$3.00.

DISCUSSION.

Question: Do you find it necessary to elongate the lower incisors? Answer: Sometimes. A wire may be fastened around the bicuspid.

Question: Are the lower incisors ever drawn forward? Answer: They are sometimes sore and sometimes loose, but the pressing of the lower incisors forward does not seem to occur.

Question: Could this be done on a girl of eighteen? Answer: Of course, the younger the better and easier. Yet move-

ment of teeth is possible at a later age, as shown when a man of forty years loses a tooth the opposing tooth elongates.

Motion by Dr. Horatio C. Meriam—That the society extend a hearty vote of thanks to the essayists. Carried.

SECOND DAY—AFTERNOON SESSION.

The meeting was called to order by the president, Dr. Ned A. Stanley, at three o'clock, Thursday afternoon, June 10th.

The first order of business was the reading of a paper by Leon S. Medelia, M. D., entitled "Opsonic Therapy."

OPSONIC THERAPY IN PYORRHEA ALVEOLARIS.

BY LEON S. MEDALIA, M. D.

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INTRODUCTION.

Before considering the actual application of opsonic therapy to pyorrhea, a few words explaining the fundamental principles and scientific basis for this method of treatment would not be out of place.

In 1884 Metchnikoff, the great scientist, now at the head of the Pasteur Institute, demonstrated to the medical world the value of the white blood corpuscles in protecting the human body against disease. These white blood corpuscles, also known as soldiers of the body, or phagocytes, were definitely considered by Metchnikoff in 1892 to be the sole agents in ridding the human body of disease-producing organisms.

Sir A. E. Wright, of London, has demonstrated (1903) that the blood serum contained a substance which acted upon the bacteria, making them attractive food for the white blood corpuscles. This substance he called opsonin (Latin, *opsonare*, *opsono*—I cater, I prepare food for), a term, as you can see, descriptive of its function. Wright's findings then partly disprove Metchnikoff's theory of phagocytosis.

With these findings as a guide Wright developed a technique by which he could determine the amount of opsonins present in the blood serum of any human being as compared with that of any

* Read at the Annual Meeting of the Massachusetts Dental Society, June 10, 1909.

other human being. You can see immediately the value of such a technique in diagnosis. With the number of opsonins present in a healthy human body as a standard the relative percentage of that substance as found in the diseased body is easily computed.

The technique, briefly, consists in mixing equal volumes of washed white blood corpuscles, plus a suspension of bacteria, plus normal serum, allowing the mixture to be incubated in an oven, at 37 degrees C. for 15 minutes, at the end of which time this mixture is smeared on slides, stained and the number of bacteria in 50 white blood corpuscles counted. The total number of bacteria is then divided by 50 and the average per corpuscle is known as the *phagocytic index*. This test being a comparative one, it follows that the procedure has to be carried out again, using this time the blood serum of the patient instead of the normal one.

Thus we have two (2) stables and one variable, the stables being the washed white blood corpuscles and the suspension of bacteria, while the variable is the blood serum, in one case using the *normal* serum, in the other test using the *patient's* serum. The average number of bacteria taken up by each corpuscle or the *phagocytic index* of the patient's serum divided by the average number of bacteria per corpuscle of the normal serum is what is known as the *opsonic index*; in other words, the opsonic index is the amount of opsonins contained in the *patient's blood serum* as compared with that contained in the *normal blood serum*.

The scientific facts previously described combined with this ingenious technique have enabled Wright and his followers to make a diagnosis in obscure infectious diseases demonstrating the particular germ causing the infection. As the test does not require more than a few drops of blood from the ear, you can readily see of how much value it is in helping to establish a diagnosis in obscure infectious diseases, if, of course, the test is at all dependable.

Having found the *opsonic index* of the patient, to the germ with which he is infected, low, as compared with that of the normal, the next step was to raise the index. This Wright found could be done by what we know now as *opsonic* or *bacterial vaccines*. These vaccines are made by growing the bacteria upon artificial culture media, washing off the growth with sterile salt solution, killing it by heating to 60 degrees C., counting the number of bacteria in the suspension and standardizing it to a certain

strength ready for use in the treatment. Thus the vaccine is nothing more than dead bacteria suspended in sterile salt solution, and is *not* an *animal serum*. The specific vaccines, Wright demonstrated, if injected subcutaneously into the patient, would tend to raise his opsonic index and assist in curing him of the disease, at the same time conferring immunity for a lesser or greater period.

OUR OWN WORK ALONG THESE LINES.

It is almost three years since I started this work at the Tufts Medical School. It has been my pleasure to demonstrate to the medical profession the value of this method of treatment—its limitations, successes and failures. I am, therefore, in a position to talk from personal experience as well as from reports brought to me by clinical men as to what may be expected in treatment with vaccines, where it may be of value, and where it may fail; as well as the value of the opsonic index in diagnosis and treatment. I have simplified the technique (a description of the details of which may be found in a previous communication)*, so that where it meant hours to make an opsonic estimate it is now a question of minutes (20 to 30) to test a blood. And where we had to wait a day or two before beginning actual treatment we can now start immediately, especially where we know from previous experiences in similar cases what the infecting agent might be.

*Bacterial Opsonins and Vaccines, Communication of the Mass. Medical Society, Vol. XX., No. 111, 1907, Page 671, Leary & Medalia.

I shall now briefly discuss the practical application of vaccines in the treatment of disease, paying special attention to those infectious diseases which interest you, as dentists, particularly.

STAPHYLOCOCCUS INFECTIONS.

The treatment of staphylococcic infections, such as furunculosis, boils, carbuncles, acne, acute osteomyelitis, acute alveolar abscesses and infection of the antrum of Highmore, yielded remarkably well to staphylococcus vaccine. Some eczemas, especially of the new-born type, have shown good results. Some eyes have been saved in cases of hypopyon following a cataract operation. On the whole, any lesion which culturally was shown to be due to staphylococcus yielded promptly, in almost every case, to vaccine treatment. The dose varied from 300 to 1,200 millions once every two days or twice a week (8 minims of this vaccine contain 500 million organisms).

STREPTOCOCCUS INFECTION.

The use of the streptococcus vaccine, especially the autogenous, was found by us to be of value in the treatment of puerperal septicemia, appendicitis, sore throat due to strepto, measles, scarlet fever, and other infections where the streptococcus could be demonstrated. The streptococcus is responsible for a good many more deaths than it is given credit for; this organism is found to be responsible for the secondary infections in measles, scarlet fever and diphtheria, fatalities in which diseases are usually due to the secondary infection. Although several lives have apparently been saved by the treatment with the strepto vaccine, as in septicemias and other strepto infections where all the ordinary methods of treatment have failed, yet the use of the vaccine of this organism has not given such uniform results as is obtained by the use of the staphylo vaccine in staphylococcus infections. In about 80 per cent. of the strepto cases the results were positive (cured or benefited). The rest either totally failed or were slightly benefited. The amount used was from 25 to 100 million every 5 or 6 hours in septicemic cases. In more subacute cases once every two days or even less frequently.

COLON INFECTIONS.

The colon vaccine has almost always given most satisfactory results in cases where the lesion was unquestionably due to colon, such as fulminating appendicitis, peritonitis, cystitis, rectal fistulae, auto-intoxication, and intestinal disorders when due to colon. Here the autogenous vaccine, the vaccine made from the patient's own culture, has always given better results than the stock, and seemed to be a necessary element in obtaining good results. In typhoid fever where the colon plays the part of a secondary infection the use of a colon autogenous vaccine has been of considerable benefit to the patient. In some cases of old-standing bacteriurea, however, the treatment has failed. The dose was from 25 to 100 or 150 million every eight to ten hours in acute cases, or every two days and once a week in subacute and chronic cases respectively.

TUBERCULOSIS.

The use of tuberculin, T. R., (Koch's new tuberculin) is of value in localized tubercular infections. In consumption and other mixed tubercular infections the use of vaccines correspond-

ing to the organisms responsible for the secondary infection is of more benefit when used together with tuberculin than the T. R. alone. Dosage used in localized lesions was from 1-2,000 mg. to 1-500 mg. Inphthisis dosage was from 1-4,000 mg. to 1-1,000 mg. of the T. R., preferably, as I have just stated, together with the vaccines to combat the secondary infections.

OTHER ORGANISMS.

The use of other organisms, such as the gonococcus in cases of gonorrheal arthritis and even acute gono, has met with some success, especially in children. The use of autogenous vaccines of whatever organism has not been altogether unsuccessful. Those studied were mucosus capsulatus, micrococcus catarrhalis, pseudo diphtheria bacillus, bacillus lactis aerogenous, and others.

PNEUMOCOCCUS INFECTION.

I have reserved the discussion of the pneumococcus for the last because it is the most important of all the pathogenic bacteria from the standpoint of the dental profession, since a large majority of the infectious processes of the mouth and oral cavity are due to this organism. Even systemic diseases, such as rheumatism, are recognized to be due to an absorption of toxins produced by a localized infection of the throat and mouth, such as Riggs disease and tonsilitis. The pneumococcus has been used with good results, either alone or together with the staploylococcus vaccine, in the following: Acute bronchitis, acute articular rheumatism, in the so-called "colds" where due to the pneumococcus, in cases of lobar pneumonia, and lately it has been used with marked success in cases of pyorrhea. On the whole, any lesion of the mouth, nose or respiratory tract which has shown by cultures or the opsonic index to be due to pneumococcus gave uniformly good results. The injections varied from 50 to 200 million every six hours in acute infections and once every three days to a week in subacute or chronic cases.

APPLICATION OF OPSONIC THERAPY IN PYORRHEA.

With the foregoing brief outline of the application of opsonic therapy to infectious diseases, in general, as a basis, we will now consider its specific application to pyorrhea alveolaris.

PYORRHEA ALVEOLARIS.

The first case that came under my observation was brought

to me by a clinical man. A specimen of the patient's blood was obtained for opsonic estimations, and a swab from the pus for cultural purposes.

The opsonic findings were practically normal to T. B. and to strepto. Somewhat low to staphylococcus and lowest to pneumococcus. The cultures showed a pure growth of pneumococcus. A vaccine was made up from these cultures (an autogenous vaccine), with which the patient was treated on the average of twice a week. The injections ranged from 30 to 150 million of pneumococcus autogenous vaccine, together with from 150 to 500 million of staphylococcus aureus stock vaccine. Without any other treatment improvement began at the end of one week was cured at the end of six weeks, no recurrence (over a year now).

This patient had had pyorrhea of five years' standing, advanced case, had lost three teeth under instrumentation and other local treatment. At the time when vaccine treatment was begun there were two teeth slightly loose, and a great deal of pus was present around the loose teeth.

Since then we have had under observation a series of over 32 cases, 10 of whom were all cured (5 no recurrences for over a year), the rest have all shown great improvement, such as disappearance of pus, loose teeth becoming firmer, gums regaining their pinkish color and elasticity, pain practically always promptly relieved when present. The cultural findings in 90 per cent. of the above cases have shown a pure growth of the pneumococcus. The others contained alongside of the pneumo either staphylo or strepto.

These experiences could be summarized briefly as follows:

1. Cultures obtained directly from pyorrheal pus were found to consist almost always of the pneumococcus,* rarely mixed with staphylococcus or with streptococcus.

*Cultures from pyorrheal pus, throat and sputum showed a good many times a diplococcus appearing in chains. Although text books and other observers have been taking these for Streptococci, yet I felt justified in calling them Pneumococci for the following two chief reasons:

1st. The individual diplococci making up the chain had their long diameter corresponding to the long diameter of the chain. 2nd. The chains, after being shaken up for purposes of standardizing the vaccine, were found to be broken up readily into their constituent diplococci appearing morphologically like typical Pneumococci. The true Streptococci, on the other hand, have their long diameter at a right angle to the long diameter of the chain, also the chains cannot be broken up readily, if at all. A detailed study of the Streptococcus by growing it on blood

agar (Shotmüller) and other methods of cultivation will be described with reference to puerperal septicæmia in a future article.

2. The opsonic index invariably was found low to the pneumococcus, slightly low to staphylococcus, and normal to other pathogenic organisms.

3. By treatment with the proper vaccines, either autogenous or stock, the cases invariably responded either by a definite cure or by marked improvement.

ETIOLOGY.

The etiology of pyorrhea is still very obscure. The various theories brought forward by members of the dental profession do not explain satisfactorily the causative factor of the disease. The theory of faulty metabolism which occupies such a high rank in the discussion of the etiology as well as the special diathesis, as causative agents—if they mean anything at all—are not expressive enough to describe the underlying factor which gives rise to the disorder.

Of recent years, however, pyorrhea has been demonstrated to be an infectious disease, as shown by the fact that it will be transmitted from husband to wife and by the careless use of infected instruments. Experimentally, it has been shown that we can produce suppurative changes in animals, such as rabbits and guinea pigs, by inoculating them with the pus of pyorrheal patients.

Examination of cultures taken from apparently normal gums, showing in a certain percentage (about 15 per cent.) the presence of the same organisms as are found in cultures taken from pus of pyorrheal patients, i. e., pneumococcus, staphylococcus and streptococcus, the question has been raised as to the reason for my attributing to the same organisms the pathogenesis of the disease. The answer is found in the analogous condition of the well-known disease of appendicitis, the principal causative factor of which in the majority of cases is the colon bacillus, the latter at the same time being the normal inhabitant of the digestive tract as well as the appendix, and yet nobody questions the colon bacillus as being the main and most important etiologic factor of appendicitis. The explanation is that although the colon bacillus under normal circumstances is not able to produce inflammation and attack the normal mucosa of the intestinal tract or the appendix, it easily becomes the pathogenic organism as soon as the

mucosa of the appendix is rendered abnormal by concretions or other foreign bodies or as were found on sections in some cases, by parasites, like round or pin worms caught by the appendix. Hence the injury to the mucosa changing the normal epithelium exposes it to the well-known pathological changes of appendicitis.

Similarly the gum at the point of contact with the tooth is the most exposed part of the mouth to injury. Salivary or serumal calculi form and are probably due to the local inflammations brought about by the injuries and infection. Dead albuminous matter made up of the bacteria, necrotic epithelial cells, and pus cells following the inflammation, also possibly some particles of food that might happen to lodge there, all act as an organic nucleus for the forming calculus. The salts and other inorganic matter will be deposited by precipitation from the saliva or exuded serum, or lymph present in the neighborhood of this organic, dead albuminous nucleus, forming a calculus, which has the organic material as a framework. The hypersecretion and chronic inflammation caused by the irritation of this newly formed calculus produces a still greater albuminous framework into which is deposited additional inorganic salts.

Thus we have a "vicious circle," injury and inflammation forming a calculus, which gives rise to more injury and more inflammation and bigger calculi. The formation of calculi anywhere else in the body is taken as an analogy; most calculi examined are found to contain an organic nucleus. Living typhoid bacilli have been found in the center of gall stones. Experimentally, typhoid bacilli, if injected into the gall bladder of a rabbit, will produce gall stones, and the necessity for an organic nucleus in the formation of calculi is thus demonstrated and is an undisputed fact. So that the same germs which are normally present in the mouth and which are incapable of doing harm to the normal gum may become destructive to it when injured, giving rise to the suppurative and other changes about the affected tooth.

The systemic troubles, such as articular rheumatism and other rheumatic changes arising from the absorption of toxins, or possibly from the actual invasion of the system by bacteria through a local focus like the one met with in pyorrhea, is also worthy of consideration. The relation of the systemic diseases to localized infections, as of the tonsils, has been demonstrated in the past

by other investigators. And, in my opinion, pyorrhea bears the same relation to the general systemic diseases as do the infections of the tonsils. In support of this opinion, the fact that the patient suffering with pyorrhea and at the same time complaining of rheumatic pains in the joints or muscles while under treatment with vaccines has shown alongside of his improvement in pyorrhea a corresponding improvement in rheumatic symptoms.

GENERAL CONCLUSIONS—PYORRHEA.

The number of cases of Rigg's disease under observation with vaccine treatment, autogenous or stock, is too small to draw any definite conclusions. Yet the following general deductions I think I have a right to make:

1. Pyorrhea is an infectious disease.
2. Cultivation from pus shows principally a growth of pneumococcus rarely mixed with staphylococcus and streptococcus.
3. The opsonic findings yield almost always a low index to pneumococcus, somewhat low to staphylococcus, and practically normal to the other pathogenic organisms.
4. The treatment of pyorrheal cases with vaccine, preferably autogenous, yield good results. Autogenous vaccine is of course only possible where the disease has progressed to the stage of suppuration.
5. The systemic affections, such as rheumatic pains, etc., possibly originating from the local infections, show marked improvement while under treatment with bacterial vaccines for pyorrhea.

(The use of Lugol's solution *R* liquor iodi compositus, U. S. P.) as a local application, either in full strength or diluted one-half or one-fourth with water, applied by the patient once or twice a day is to be recommended as a good adjuvant to the vaccine treatment, always remembering that the iodine solution is nothing more than a good local antiseptic.)

SUMMARY.

Finally, to make a resumé of the entire subject under discussion: From my experience with the opsonic and vaccine therapy, amounting to over 10,000 opsonic estimations and in the neighborhood of 4,000 patients treated with this method, a large number of whom were members of the medical or dental profession, I have reached the following conclusions:

1. The opsonic index as a means of diagnosis, although not absolutely mathematically correct, gives us a clue as to the probable bacterial infecting agent in obscure diseases.

2. Where it is possible to obtain cultures the bacteriological findings establish the diagnosis without having to resort to the index.

3. In certain simple infections where the probable infecting agent is known the treatment may be begun immediately with stock vaccine without waiting for cultural or opsonic findings.

4. In a large majority of cases the stock vaccines will give good results, excepting in cases of colon or strepto infection where autogenous vaccine is necessary.

5. The use of the opsonic index in treatment is not absolutely necessary, but is to be recommended to determine from time to time the state of progress of the patient under treatment.

6. Vaccine therapy is very satisfactory in cases of staphylococcic and pneumococcic infections, especially in the former. Is successful in the majority of cases of colon and streptococcus infections, and is of value in tuberculosis of the lungs where the secondary infection could be determined and treated with its specific vaccine.

7. The treatment of Rigg's disease by opsonic vaccines is very satisfactory and a great deal in combatting this disease in the future is hoped from its application.

483 Beacon Street, Boston.

SUPPLEMENT.

The following charts were shown after the reading of the paper:

1. Chart showing a white blood corpuscle (phagocyte) which has engulfed some staphylococci. The nuclei of the phagocyte were stained deep blue, the protoplasm pale blue, within which were engulfed staphylococci, stained also deep blue.

2. Same as chart No. 1, but had, engulfed in its protoplasm, tubercle bacilli (red rods) instead of staphylococci.

3. Chart showing the gonococcus illustrating spontaneous or natural phagocytosis, the intracellular gonococci being found engulfed by the cells and present in their protoplasm, thus illustrating the identity between natural and artificial phagocytosis.

4. Chart showing the ideal curve of the opsonic index before

and after treatment with vaccine, showing the positive and negative phases following treatment.

5. Chart showing tuberculo-opsonic index before and after operation in tubercular and non-tubercular cases. This chart was the result of an experiment undertaken to test the value of the tuberculo-opsonic index as a diagnostic measure. The bloods were obtained by the house officer of the Carney Hospital, without letting me know, until after the observations were made, the character of the cases.

(The opsonic index in the tubercular cases has invariably been found to be below 0.8 before the operation. The indices 24 hours after the operation were always found lower than those before. While in the non-tubercular cases the indices were found higher after the operation than before. In cases where the operation was at the point of infection, the index following the operation was a great deal lower than in those where the operation was further away from the tubercular focus (such as tenotomy performed on a tubercular patient). The low opsonic index following the operation in the tubercular cases is apparently identical with the negative phase of the low index following the injection of vaccine or tuberculin. In the first case the toxins or tuberculin is introduced into the system from the patient's own infection (by manipulating or cutting into the infected focus, thus liberating the toxins), while in the latter case the inoculation is artificial.)

6. Charts showing the pneumococcus, staphylococcus, streptococcus and the tubercle bacillus. The first three are related to pyorrhea, particularly the *pneumococcus*. The tubercle bacillus needs no further comment.

The demonstration following the paper and the charts consisted in going over in detail the technique of obtaining the opsonic index, as well as the method of obtaining cultures and the preparation of vaccines. The various steps in the demonstration were:

1. Preparation of tubes for the collecting of blood for the index by drawing them out from glass tubing over a flame.
2. Collecting the blood for the index from the finger in the above prepared tubes.
3. Obtaining the washed white blood corpuscles for the test by allowing the blood to flow into a solution of normal saline con-

taining 1 per cent. sodium citrate (the latter chemical being used to prevent the clotting of the blood).

The corpuscles were shaken down with a hand centrifuge (by Dr. Belyea), resulting in a clear supernatant fluid and a sediment made up of the red and white corpuscles of the blood. The supernatant clear fluid was drawn off, the tube refilled with normal saline and the corpuscles mixed with the saline solution to wash them free of the serum that came along with the blood.

Capillary pipets were drawn out from thin glass tubing over a flame, having a small bulbular enlargement near one end, to which was attached a rubber bulb, while the other end was the thin capillary end. This capillary tube was marked off about one-fourth of an inch from the end with a glass pencil; equal volumes of the washed white corpuscles, suspension of bacteria and blood serum were drawn up into the capillary tube, each ingredient separated from the other by a bubble of air. Then the three ingredients (corpuscles, emulsion of bacteria and blood serum) were thoroughly mixed on a glass slide, the mixture drawn into the capillary pipet, the thin end sealed and while hot it was thrust through a small piece of paper upon which was written the name of the patient from whom the serum was obtained and the time. It was then put into an incubator, kept at 37 degrees C. for 15 minutes, at the end of which time it was taken out, mixed on a glass slide, smeared and stained. (Staining was done by Medalia's method; smears were fixed by corrosive sublimate, washed in water and immersed in alkaline methylene blue, alkalized with sodium carbonate.) The slides were then ready to be counted for the finding of the phagocytic index from which the opsonic index is figured out.

The same process was followed out at the same time, using the normal serum instead of the patient's serum.

The bacterial emulsion for the test was prepared by washing off a pure culture of staphylococci with sterile salt solution, killed by heating at 60 degrees C. for one-half hour.

The vaccine was prepared by washing off the growth of a pure culture with sterile salt solution, killed by heating at 60 degrees C. for one hour, the number of bacteria in the suspension determined by mixing equal volumes of the bacterial suspension and blood, counting field for field the number of bacteria and corpuscles by comparing one with the other and, knowing the num-

ber of red corpuscles per CMM. (5,000,000). The number of bacteria in the suspension can thus be easily determined. The bacterial suspension is diluted with a solution of normal saline containing one-fourth of one per cent. of carbolic acid to the desired strength per C. centimeter, and is then poured into a sterile bottle, capped with a rubber cap. The vaccine is drawn off from this bottle with a sterile hypodermic syringe, by thrusting the needle through the cap, without removing it. The desired amount is withdrawn and the rubber cap reseals itself, thus keeping the bottle sterile. The vaccine is injected subcutaneously, usually in the upper arm.

DISCUSSION OF DR. MEDALIA'S PAPER.

Dr. Frederick S. Belyea—I have had to do with getting a class to study these things. I have had a patient and received an injection. At the negative phase you feel a little depression. Then you come up and feel bully. It was my privilege to be in Dr. Medalia's office a great deal last winter. All he had was a few drops of blood to diagnose. If it is done right the opsonic index is reliable, if not, the likelihood of error is always present.

Dr. Julius G. W. Werner—If this is applicable to pyorrhea it comes very close to us. This has been worked out by a man who makes no mistakes. I have a patient who has periodically an eruption on the face associated with alveolar abscess. If I can convince her that she can have an autogenous vaccine it will appeal to her and it will be a strong argument in gaining her consent.

Dr. Frederick S. Belyea—I, myself, have not administered this treatment. I have had the privilege of watching several cases, some treated by myself by local treatment and some treated by local physicians by vaccine methods. In several cases of injection benefit was had. In my opinion pyorrhea is a misnomer since this is only one of the stages. I had a desperate case of gingivitis which I cured by local treatment.

Another case of recurrence with pain I had treated by instrumentation for two years. It was the old theory that a new focus was being formed, merely a new nodule of tartar. Of course this was a misnomer. When we reach a condition of pain there is always meant a loss of teeth. In this case a good result was obtained although the patient was one of those patients who do not continue easily. In my opinion the ideal treatment is opsonic

treatment, compound solution of iodine and instrumentation. You must keep in mind that although a case may seem to be healed the patient may be not yet out of pain and immediate instrumental action may not be tolerated.

Motion: That we give Dr. Medalia a vote of thanks for his able paper and clinic, with request for publication. Carried.

Dr. Everton H. Hosley—In cases of pyorrhea palliative treatment should be done first. The mouth should be healed before the scaling is done. I have had better results with palliative treatment for two or three weeks, then if deemed best surgical treatment can be carried out.

Dr. Horatio C. Meriam—The proper treatment with acid does away with the necessity for much of the instrumentation. Full strength sulphuric acid is placed in the pus pocket with needle points of various shapes carrying one drop.

Dr. Frederick S. Belyea—If the doctor will try a strong caustic alkali he will get the same result as with acid. I believe the result is brought about by destruction of the diseased tissue and the removal therewith of the colonies of germs, etc.

Dr. Medalia—The scientific explanation is that we have proud flesh that is shown to be due to a failure on the part of the tissue surrounding the injury to overgrow with skin. Thus by its destruction we get the growth of scar tissue at this point.

Dr. Julius Werner—It takes away the cause which called for palliative treatment. Here is a case in my practice that comes to mind, of patient lost, a few years ago, because I was not willing to deplete his purse by continued, useless, palliative treatment.

Dr. Medalia, closing the discussion—It seems that some men do not get on to the method whereby Pyorrhea comes about. Injuries are most frequent in the mouth at the point of contact of the gums with the teeth. An injury occurs, for instance one caused by a fish-bone, and in the event of the introduction of pathogenic organisms into the deeper structures we get besides the serous exudate bacteria, dead leucocytes and dead serous exudate from which the serum calculus is formed. We get infection between the teeth and the gums. Then we get the tissue cells that cannot be readily gotten rid of. Now all that is necessary is the death of the cells brought about by the inflamma-

tion. You have an organic nucleus introduced into these solutions and serum. Immediately we get a deposit of inorganic walls around the nucleus. The next step is the formation of the calculus due to more death and more exudate, more organic secretion and more inorganic walls deposited, hence we go on indefinitely. Thus you can see how it goes on to pus production and how the germs finally penetrate into the gums and teeth. Later we get the full consequences of the disease. Under the circumstances you cannot hope for anything better than a surgeon can hope for in cutting open a boil. As far as the development of pyorrhoea is concerned I know of no better description than I have given this afternoon.

Now there has been brought into this discussion the question of intestinal disorders. Indigestion may be due to lack of chewing, long sitting, etc., which may have to do directly with the matter of bad teeth. A second question may be the amount of bacteria swallowed. This matter makes such a case a question of waste products and auto intoxication but of the bacteria swallowed with the food injected.

I wish to thank you for your courteous and prolonged attention to this rather technical paper and to express my pleasure in giving it.

Dr. Everton Hosley read the following letter from Dr. Chester T. Stockwell:

Stockbridge, Mass., March 10, 1909.

Dear Dr. Hosley:

The notice of the Valley District Society's next meeting has just arrived, and I note that you are to open the discussion of Dr. Beecher's paper on prophylaxis, and this reminds me that I had intended for sometime past to write you a line on a matter brought out in your London paper, in which you advocate, if I remember correctly, the 25 per cent. solution of alcohol as a prophylactic mouth wash. It was a new idea to me, and I began to think of it, and to consider *how* it could be effective.

As I understand the matter the function of alcohol in such a case—that is in the mouth—would be to react upon the mucus; and as the mucus patches or "plagues" upon the teeth harbor the destructive bacteria, this reaction of alcohol upon these mucus plagues tends to break them up, and thus prevent the deleterious action of the bacteria upon the teeth.

As you know, perhaps, I used hydrogen peroxide in my practice very generally for some mouths before my sickness began, and with satisfactory results. That is, I prescribed it for daily use to a large class of patients, especially those who were afflicted with "Rigg's Disease." But as I now understand the matter the *reaction* of H_2O_2 upon the *mucus* is not as great or as effective as that of alcohol; but the reaction of H_2O_2 upon the bacteria per se is greater than that of alcohol.

Coming to this conclusion I said to myself: "Why not combine the two?" And so, if I were now in practice, I think I should try—say, two parts hydrogen peroxide, one part alcohol, one part water—with perhaps a little glycerine added. This solution to be used full strength by the patient daily, night and morning. I'm thinking now especially of preventing decay of the teeth, not so much of Rigg's Disease. To put the matter in other words, I should say that alcoholic solutions are better adapted to *break up* the mucus plagues than H_2O_2 ; but that you want the H_2O s to "kill the bugs," after they have been denuded, or exposed to its more ready action by the alcohol.

I offer this suggestion, doctor, tentatively, hoping it may not prove amiss in the discussion.

Should one not wish to use hydrogen peroxide, a combination of alcohol and electrozone might be advantageous.

There is also one other thing I wish to mention in this connection. The older members all know that my interest in prophylaxis has always been greater than in the mere mechanical side of our profession. Prevention has, at least, been my ideal; and I consider it the ideal of the profession.

For some months before my break-down I had been experimenting with nitrate of silver, with the hope that a class of cases with which we have to deal might be prevented, at least to some extent. I refer especially to the six year molars soon after eruption. You all know that these teeth decay very readily, sometimes almost as soon as they appear. Parents, about 50 per cent. of them at least, regard the first molars as belonging to the "first set," and so give them little or no attention until too late to get the best results. But whether they were so regarded or not, I felt the need of some measures of protection against early decay in these cases. And so I resorted to nitrate of silver.

My method was to first clean these teeth *very thoroughly*,

especially the crown and buccal surfaces. Then, with a sharpened orange wood stick, rub into all the fissures and depressions the salts of silver nitrate, being careful to carry it down to the bottom of the fissures at every possible point, and also going over the buccal surfaces close to the gum margins. One should not be in a hurry about it, but take all the time necessary in order to do the work thoroughly. In some cases I included the bicuspid in the same treatment.

Now, when the misfortune of invalidism came upon me I had not proceeded far enough with the experiment to warrant reporting results; and so I have no opinion, at the present time, as to whether good may come of such treatment or not. I cannot, however, conceive that harm would follow such a course of procedure.

It would please me much if one or more members of the society would take up the experiment and carry it forward to a definite result. It *may* be nothing new; but I have known of no attempt being made to use silver nitrate for this particular purpose. We all know that it has a large field of usefulness in the treatment of incipient decay of the teeth, especially with very young children. Why may it not be useful in *preventing* decay, in the deep sulci of the first permanent molars especially?

A slight staining will follow its use *if* the enamel folds are not perfectly united in the deeper portions of the sulci. But it is just these cases that are so apt to decay early; and it is very important to, at least, retard this decay as long as possible. Will someone be kind enough to work out the problem in a thorough and satisfactory manner?

I shall be with you, doctor, in spirit, at this meeting, as I always am; and I would be kindly and gratefully remembered to all.

By keeping quiet, I am, most of the time, reasonably comfortable; but I am still in the grasp of a great weakness.

With abundant good will and good wishes for all, I am

Yours sincerely,

C. T. STOCKWELL,

Dr. Everton H. Hosley—Dr. Stockwell is an old and valued member of this society. I feel indebted to him for many things. The Essay Committee thought this letter might be an inspiration

and help to many of the members. Dr. Stockwell has done much along the lines of prevention and of scientific dental research. I will say that these experiments have been tried and have proved successful. We take it for granted that the molars will decay and by so acting in advance we do prevent decay as has been proved by five years' experience.

Dr. Ned Stanley—These instances are very interesting. We are more and more realizing the usefulness of silver nitrate.

Motion: That the thanks of the Massachusetts Dental Society be extended to Dr. Stockwell, and that we extend to him our hearty good wishes and show him that we are thinking of him.

EVENING SESSION.

The meeting was called to order by the president, Ned. A. Stanley, at 8 o'clock Thursday evening, June 10th.

The first order of business was the reading of a paper by Dr. Herbert McIntosh on "Dental Skiagraphy."

THE X-RAY IN DENTISTRY.

A Paper Read Before the Massachusetts Dental Society,

June 10, 1909.

BY HERBERT M'INTOSH, A. M., M. D., BOSTON, MASS.

Illustrated by Stereopticon Views.

I can scarcely hope to bring before this association anything that is absolutely new in relation to this important subject. The great aggregate of knowledge in any department of human effort is made up of many contributions from numerous writers, and the distinction of making large additions thereto is earned by relatively few. I shall, therefore, endeavor simply to tabulate briefly the great services which this wonderful discovery is capable of rendering to your vastly useful field of professional endeavor. The advantage of such a tabulation and resumé is that it gathers up the scattered facts that are found here and there and presents them in a convenient form for future reference.

A few moments may in the first place, however, be spent in describing the X-Ray tube. Fig. 1.

It is essentially a glass tube of exceedingly thin walls, ex-

panded usually into a globular form, and having a metal wire soldered into it at opposite ends. These constitute the poles. The negative pole is expanded in the interior of the tube into a concave disk. The tube is exhausted by a mercury pump to a vacuum exceeding the millionth of an atmosphere. When a current of electricity is passed through such a tube from the positive pole or anode to the negative pole or kathode, a peculiar phenomenon appears. A stream of rays is shot off from the concave surface of the kathode, to which the name kathode rays is given. These are believed, according to the electron theory, to be the ultimate particles constituting matter. Ordinarily they do not get outside of the glass walls of the tube unless a window is especially constructed to permit their exit. When, however, these rays are focused upon a target which is placed midway between anode and kathode, there is immediately created within the tube a green hemisphere of light constituting the fluorescence produced by a new species of energy which it became the rare distinction of Dr. Wilhelm Conrad Roentgen, in December, 1895, to disclose to the scientific world. The new type of energy produced by the impact of the kathode stream upon the target of the focus tube, unlike the kathode stream, was found to be capable of getting outside of the tube. Dr. Roentgen found that it had the power of causing fluorescence in a screen covered with platino-barium cyanide, and that it affected photographic plates in a manner somewhat similar to light. To this ray, with its mysterious power of penetrating opaque substances, he gave the name "the X-Ray," because the *data* for properly classifying it and relating it to other forms of energy had not then been fully collected. The inestimable service which this discovery was capable of yielding to science was immediately appreciated, and not less in your important and indispensable specialty than in other fields of professional endeavor.

As early as February, 1896, two months after the discovery of the X-Ray, Professor Koenig showed a skiagraph of the teeth to the Society of Physics at Frankfort, Germany; and in June, 1896, seven months later, the *Dental Cosmos* published an article by Dr. W. J. Morton, of New York, entitled "X-Rays in Dentistry."

For the examination of the teeth and associated structures, two methods may be employed. These are, (1) fluoroscopic, and

(2) radiographic. The fluoroscopic method employs an instrument called the dental fluoroscope. This is a flat disk of ground glass covered with platino-barium cyanide and attached to a metal stem. This is introduced into the mouth of the patient in such a position as to receive the shadow of the area under examination upon a small screen whose surface is coated with a layer of platino-barium cyanide. This material has the property of fluorescing under the influence of the X-Ray, and thus revealing by variations in density the character of the tissues through which it passes. In this examination the patient and operator, together with the focus tube, are preferably in a darkened room, or a dark cloth may be used to exclude the light, being thrown over both patient and operator. The fluoroscope is of slight value in dental skiagraphy.

The radiographic method is of very great utility. This includes the use (a) of films placed within the mouth behind the area to be examined, and (b) of plates placed external to the teeth. The former consist of celluloid coated with a sensitive emulsion similar to that employed in the ordinary folding kodak. They are supplied by the manufacturer in black envelopes, two films being in each envelope with the sensitive surface toward the smooth part of the envelope. The dimensions of the envelope are $1\frac{1}{4} \times 1\frac{5}{8}$ inches.

It is well to undertake to obtain a skiagraph of not more than one or two teeth at a time, since the curve of the jaw will necessarily produce considerable distortion in the outlying portion of the skiagraph. The target should therefore be adjusted so as to throw the rays as nearly as possible perpendicularly upon the part to be skiagraphed. This will necessitate placing the tube at a considerable distance above the jaw, when skiagraphs of the upper teeth are to be taken, in order to place the surface of the target as nearly as possible parallel with the surface which is to be skiagraphed.

The tube having been put in proper relation to the patient, the film is placed in the mouth and held in position by the fingers of the operator or his assistant. In order to avoid destruction of the film by saliva it may be wrapped in wax paper. The length of exposure will depend upon the character of generator used and the quality of the tube. For dental skiagraphy small, portable coils may be used, requiring an exposure of from 30 seconds to a

minute or more. Of these the Kin-Low, Fig. 2, and the Victor, Fig. 3, do excellent work. Larger coils may, of course, be used, reducing the period of exposure if desired.

The static machine produces admirable results, the current being steady and small machines being sufficient for satisfactory work. A high speed static machine, Fig. 4, having two revolving plates and producing a current of from one-half to one milli-ampere is admirably adapted to this purpose. This generator is almost noiseless and practically independent of weather conditions. The use of additional plates proportionately increases the amperage. There can be little question that a high speed static machine having a suitable number of plates is adequate to every skiagraphic demand.

Elaborate arrangements are not needed for successful work in dental skiagraphy. The patient may be seated in an ordinary chair, and as the period of exposure is not extended, it is not necessary to fix the head, though there is, of course, no objection to this procedure. The development of the films does not differ essentially from the technique employed in photographic work.

The film may be held in place by the finger of the patient or the operator, or it may be attached to an impression of the jaw made with modeling compound, to which the film is attached. When the jaw is closed the film is held firmly in position. Fig. 5.

The first thing to be considered in the study of skigraphs is the appearance of the normal tooth with its alveolar process. Fig. 6.

Here you will notice that the tooth is indicated by a dark shadow through which runs a lighter shadow which marks the root canal. Surrounding the tooth is a stippled or mottled shadow which shows the alveolar tissues and is of less density than that which represents the tooth. This is closely adherent to the tooth.

What modifications of this picture will occur in pathological conditions? These show themselves chiefly in the appearance of the alveolar tissues. These become lighter in color where there is pericementitis or pyorrhea, or where abscesses have formed and destroyed the structure of the alveolar tissue. In many cases the alveolar process is no longer closely adherent to the tooth,

but is separated from it by an area indicated by lighter shadow. Fig. 7.

The skiagraphs thus far described may be termed intraoral. This method may be supplemented by the extraoral method. This consists in skiagraphing the teeth with the accompany sinuses of the face upon a plate placed external to the mouth. Fig. 8.

Here there is, of course, a certain superposition of images with a degree of confusion resulting from the multiplicity of shadows. On the other hand, certain kinds of information are obtained which cannot be secured by the intraoral method. Among these are the relation of the roots of the molars to the floor of the maxillary sinuses. Occasionally such a radiograph will reveal the presence of a broach in the maxillary sinuses (Fig. 9) which has given rise to the production of pus, and thus disclosed the necessity of drainage, through the socket of the offending tooth. It will also reveal peculiarities in the formation of the floor of the maxillary sinuses, including the point of election for drainage in cases of empyema of the maxillary antrum. Fig. 10.

Since the ethmoid and frontal sinuses are so related to the maxillary sinus that infection of one antrum may mean infection of all, the importance of determining the condition of the antra by skiagraphs becomes important. A diseased root may infect the maxillary antrum and conversely a diseased maxillary antrum may infect an otherwise healthy roof. Fig. 11.

UTILITY OF DENTAL SKIOPHGRAPHS.

I shall now proceed to enumerate the purposes for which dental skiagraphs are useful, with illustrations upon the screen, so far as I have been able to obtain them. These lantern slides are made from my own collection of skiagraphs and from others which have been kindly loaned me for this occasion. In some instances they are obtained from reproductions which have appeared in the dental magazines. I am indebted to Dr. F. K. Ream, of Chicago, and Drs. M. L. Rhein and Sinclair Tousey, of New York, for a number of illustrations, and to Drs. Sherman, Johnson, Cummings, and Nordgren, of this city, for others.

1. *To indicate the position of unerupted teeth.*

Figure 12 shows an impacted second bicuspid, the first molar having been removed. The light space above shows destruction of tissue. In this case there has been a discharging sinus evi-

dently connecting with the area indicated by the light space in the skiagraph. The indication was, of course, to remove the offending tooth, which was probably the cause of all the trouble. The patient was referred to me by Dr. Barlow to determine the cause of the discharging sinus.

2. *Where the full number of teeth is wanting, to show whether the tooth is present in the alveolus, (Figs. 13, 14, 15, 16, 17,) or whether the retard eruption is due to impaction.*

This skiagraph shows presence of the tooth in the alveolar tissue, delay in eruption being due to impaction.

3. *To show the position of an impacted third molar. Fig. 18.*

In the second molar a filling is shown in close proximity to the pulp.

Figures 19, 20 represents a skiagraph of a dried bone specimen. It shows beautifully the presence of an impacted third molar. The whole area about the roots of the third molar show the results of tissue destruction. This is a specimen taken from the collection of Dr. Cryer.

4. *To determine whether teeth are permanent or deciduous.*

Figures 21, 22, represent a deciduous tooth with the root absorbed and the permanent tooth immediately below it.

5. *To show the condition about the roots of implanted or re-planted teeth.*

Figure 23 shows a tooth which had been removed and re-planted. The skiagraph, taken a year after replanting, shows the alveolar tissue adherent to the root, and the tooth firmly rooted.

6. *To show the existence and extent of an abscess.*

In Figures 24, 25, 26, 27, 28, 29, the light area around the roots of the molar shows the presence of an abscess.

7. *To show whether an instrument or portion of an instrument has been left in the canal or extends beyond the apex.*

Figures 30, 31, 32, show the presence of a broken broach in the root canal, while Figure 33 shows two broaches extending beyond the apical foramen.

Figure 34 represents a broken instrument in the alveolar process.

8. *To show whether or not the canal has been completely filled, or whether the filling has protruded through the apical foramen.*

In Fig. 35 the gutta percha filling is shown as having passed through the apical foramen. There is also shown the evidence of lost tissue due to an alveolar abscess.

9. *To show the existence of roots lying within the alveolar process.*

In this case, Fig. 36, a root has been left in the alveolus after unsuccessful extraction.

10. *To show whether or not the roots of teeth have been fractured as the result of a fall or blow.*

Figs. 37 and 38 show a tooth in which fracture of the root was suspected. The skiagraph, however, reveals no damage to the root with slight affection of the alveolar process.

11. *To indicate the presence of supernumerary teeth.*

Fig. 39 represents a skiagraph in which a dark spot is displayed between the roots of the central incisors. This is a supernumerary tooth.

Fig. 40 represents a well developed supernumerary tooth. This is the small tooth between the lateral incisor, and the canine.

12. *To show whether the root of a tooth is strong enough to support a crown, or serve as a support for a bridge, or suitably located for that purpose.*

Fig. 41. The skiagraph here shows a small tooth with root so superficially implanted as to render it unsafe for an anchorage for bridge-work.

Fig. 42 shows a tooth which was tubed and capped to support a bridge of nine teeth. The experiment failed. The X-ray would have shown the futility of the attempt.

13. *To show whether teeth are misplaced, unerupted, or impacted. Sometimes these three conditions will occur together, as in Figures 44 and 45.*

14. *To ascertain by the introduction of a wire whether the end of the canal has been filled. Figure 46.*

This skiagraph shows very clearly that the end of the root canal has not been reached. In this case Dr. Rhein, after seeing the radiograph, concluded that two more sittings would be required, in order by chemical treatment to reach the end of the root.

When it is considered that according to the statement of Dr. Lewis, 90 per cent. of all cases of abscess which he has radiographed have been due to improper or short root fillings, it would

seem scarcely too much to say that wherever there is doubt as to whether the end of the root canal has been reached assistance should be obtained from a dental skiagraph, which will infallibly clear up all uncertainty.

On the other hand, Figure 47 shows a wire which has been passed through a channel drilled between the lingual and buccal roots and passed up into the maxillary antrum. Antral empyema is no doubt frequently caused in this manner.

Figure 48 shows a skiagram of root canals perfectly filled, the gutta percha filling running down to the apical foramen.

15. *To show the presence of fillings which encroach upon or enter the live pulp cavity.*

Where a filling is placed at right angles to the rays as they pass through the tooth, this condition is readily disclosed. If they happen, however, to be in whole or in part in the path of the rays as they pass through the root canal the skiagraph would not furnish conclusive evidence, since the shadow of the filling would be wholly or partially superimposed upon the shadow of the root canal.

In Figure 49 are shown both conditions. In the right hand tooth is shown a filling in the path of the rays as they pass through the root canal. Here it would be impossible to determine whether or not the filling encroached upon or entered the root canal. In the left hand tooth, however, is seen a filling which being in the path of the rays not passing through the root canal is clearly seen to be a considerable and probably safe distance from the root canal.

16. *To disclose the presence of pulp stones.*

Here, there is some difference of opinion among dental skiographers, Tousey and Lewis affirming that they can be displayed, and Saterlee declaring that he has not been able to demonstrate them.

Figure 51, however, clearly reveals a pulp stone.

17. *To disclose an exostosis of the roots of a tooth.*

18. *To disclose a necrosis of the maxillae.*

19. *To disclose the presence of a sarcoma.*

Fig. 52 represents a skiagraph of a sarcoma of the lower jaw.

20. *To disclose a fracture of the maxillae.*

21. *To disclose a dentigerous cyst.* Fig. 53.

22. *To disclose the presence of an odontoma.* Fig. 54.

23. *To show the presence of localized deposits upon the teeth.*
24. *To differentiate between pyorrhea alveolaris and conditions which simulate it.*

In pyorrhea there is a general alteration in the character of the alveolar tissue, the walls of the alveolar process are no longer adherent to the tooth, and a light area about the tooth indicates the changes which have taken place in the structure of the periodontal tissues. Cases which simulate pyorrhea are often due to deposits upon the teeth, to inflammation of the pericementum, or to the irritation of a filling upon the unremoved pulp.

In this latter the alveolar tissue is closely adherent to the tooth and has not undergone alteration.

Figure 55 shows the appearance of the alveolar tissues affected with pyorrhea.

25. *To show the cause of reflex lesions.*

In all cases of obstinate neuralgia of the fifth nerve, examination of the teeth should be made in order to ascertain, if possible, the presence of tumors, pulp stones, abscesses, cysts, foreign bodies, or any other possible cause of persistent irritation. The extraoral method here become necessary. Such diagnostic measures may avert the capital operation for removal of the Gasserian ganglion with its attendant perils and frequent disappointing results.

In Figure 57 an impacted third molar is shown which had caused the absorption of the distal root of the second molar, thus exposing the pulp and giving rise to persistent neuralgia which immediately subsided upon extraction of the second molar.

Figure 58. In this skiagraph is seen an impacted third molar, the removal of which effectually cured a long standing case of facial neuralgia.

26. *To show destruction of the root of the tooth.*

Figures 56, 57, 58, 59, 60 and 61.

27. *Miscellaneous conditions.*

Figures 62, 63, 64, 65, 66 and 67.

THERAPEUTICS.

The principal diseases which present themselves in this connection are pyorrhea alveolaris, and malignant tumors. The first is notoriously rebellious to treatment, the latter are, of course, fatal if not cured or arrested. As to the first it is sufficient to say

that X-Ray treatment ought to be employed in connection with such other treatment as the physician has found of value. Suppurating glands, indolent ulcers, chronic eczema, and many other diseases are greatly benefited and often cured by X-Ray treatment. It is a question whether failures, when they occur, are not due to errors of technique. Pyorrhea has been favorably affected by the use of the X-Ray and ought to be faithfully employed. In inoperable cases of the maxillae like sarcoma, the choice lies between Coley's serum of the mixed toxins of erysipelas and bacillus prodigiosus, and the X-Ray. The cure of sarcoma has been repeatedly reported both by Coley's serum and by the X-Ray. In antral cases where all other methods have failed exposure to the X-Ray has resulted in cure.

A word in conclusion as to filing cases of dental skiagraphy. A careful record should be kept of all cases coming under the physician's care that require diagnosis by skiagraphy. They are highly useful for reference, and are thus available for reporting for the instruction of one's colleagues in the profession.

For this purpose I use a card of Bristol board with a blank space for pasting the print with all the useful data, viz: name, residence, and age of patient, location of teeth, diagnosis, make of film, time of exposure, distance, tube employed, generator, etc. An envelope with similar data receives the card.

Figure 68 is a picture of the card which I have just described, with envelope. Figure 69.

In this attempt to tabulate the services which the X-Ray may render to the dentist, I have endeavored not to over-estimate its utility. It may be said with truth that its value is quite as great for the dentist as for the general surgeon or internist.

419 Boylston Street, Boston, Mass.

BUSINESS.

Secretary Charles Rodgers read a telegram from Washington in regard to pending legislation.

Motion: That the Massachusetts Dental Society indorses the bill as presented and a message to that effect be forwarded by the secretary to the proper authorities.

DISCUSSION OF DR. M'INTOSH'S PAPER.

Question by Dr. Stanley—In adjusting the film can the film be placed in close contact with the tooth?

Answer: Immediately against the tooth or teeth. The smooth portion of the envelope containing the film is placed against the teeth. The films are inside of black paper. The black paper being impervious to sunlight and not to the X-Ray. We must be careful to hold the film at right angles to the rays or else you will get distortion. It is a valuable expedient to have a modelling compound impression to hold the envelope with the film against the mouth.

Dr. Stanley—I suppose the lighter places in one of the last slides are due to the pulp stones as you say. Yet I should suppose the pulp stones, being denser, would cause dark spots rather than light.

Dr. Everton H. Hosley—Such skiagraphs as I have had occasion to study have shown the pulp stones lighter instead of darker.

Dr. McIntosh—I must confess there is a discrepancy here that I am unable to explain. Some operators claim that an object of such slight excess density cannot be detected by the X-Rays.

Motion: That the Massachusetts Dental Society pass a vote of thanks to Drs. Rogers and McIntosh.

BUSINESS.

Secretary Rodgers presented the matter of the amendment printed in the program. Carried.

Secretary Rodgers announced that Dr. C. E. Abbott had resigned the office of Assistant Secretary and had been elected Editor, and that Dr. Coleman Tousey had been chosen Assistant Secretary.

Motion: That the State Navy Bill 1015 be indorsed by the Massachusetts Dental Society. Carried.

President Ned A. Stanley appointed a committee to induct the president-elect, Dr. Cornelius S. Hurlbut, to the chair. Dr. Hurlbut spoke briefly as follows:

"Springfield has come to Boston and now Boston must come to Springfield, that each may appreciate the other's good points. I want each member to consider himself as a committee of one to be present next June. We need the support and assistance of every member of the State Society."

Dr. Waldo Boardman presented the report of the committee

on the president's address. The committee concurred in the action of the Council in regard to the Journal.

There being no further business the Society adjourned until the next annual meeting in June, 1910, at Springfield.

OXYDASE IN SALIVA.

The following series of experiments are the outgrowth of our attempt to answer the question regarding the presence of a germicidal agent in the saliva, asked by Dr. H. C. Ferris as correspondent for the New York Dental Society. At about the time we received his communication our attention was called to an oxydizing enzyme which was shown to exist in milk and immediately the possibility of such an enzyme being present in the saliva suggested itself as perhaps being an answer to Dr. Ferris's question.

Enzymes distinguished by their power to induce chemical changes by means of the utilization of oxygen and hence known as oxydizing enzymes are of increasing importance. The fact that these ferments may be rendered inert by slight departure from the normal condition, addition of alkaline or acid, explains in great part at least why they have not been isolated and more thoroughly studied.

Oxydases have been found to exist in milk, in blood, nasal mucus, tears, and semen, in many of the organs, and also the muscular tissue. They exist moreover in the vegetable kingdom from which the subject of oxydizing enzymes was first studied by Bertrand and Bourquelot.* The urine, bile and intestinal secretions are said not to contain a ferment of this kind.

*Enzymes and their Applications, Efferant: Prescott's translation. This work is also authority for statement immediately preceding regarding the sources of oxydizing enzymes.

All samples of saliva give evidence of containing an oxydizing enzyme, *Paul Carnot claiming to have found it in the salivary secretions of babies only a few months old.

In testing the saliva we find the most satisfactory reagent to be pyrocatechin. Guaiacum has been used perhaps more than any one substance as a test for an oxydase, but is the least trustworthy.

Pyrocatechin responds to only one or two occasional constituents of the saliva other than the oxydizing enzyme.

The reagents used were selected from a number mentioned in Pierre See's "*Des Applications Therapeutiques Des Oxydase et des Metaux Ferments*" as being best adapted for the particular purpose of detecting an oxydase in the saliva, and were as follows. A tincture of guaiacum; a solution of guaiacum of 75 per cent. solution of choral hydrate: pyrogallol: hydroquinon and pyrocatechin; Paraphenylene-diamine in solution with sodium carbonate and alpha-naphthol, in molecular proportions, was also used, and while the reaction was immediate and well marked, it was rejected as a test for oxydase because simple exposure to air gives a purple color which would be likely to lead to erroneous conclusions.

In testing samples of fresh saliva with solution of guaiacum it is necessary that the sample be made neutral or slightly acid, the acidity being best produced by either lactic or acetic acids, as mineral acids prevent the reaction. The color produced was blue. Pyrogallol gives a brown turning almost black as the reaction continues.

*P. 552, Soc. Biol., 1896, t. XLVIII.

Hydroquinon and pyrocatechin in a neutral or slightly alkaline medium only,* give a light brown, turning to a red-brown as reaction continues. These reactions took place with every sample without exception.

Heating to 100°C. will kill any oxydase present, therefore a number of samples of saliva were heated to 100°C. and after cooling tested in a similar way to the unheated salivas. The result of this process was that with guaiacum solutions about one-half the trials resulted in the production of the characteristic blue color; with para-phenylene-diamine only a slow reaction if any took place; with hydroquinon the reaction always took place but very much slower than in the unheated saliva; pyrocatechin gave no reaction at all in any sample tried even after a number of hours standing.

These results showed that something other than an oxydase must be present in the saliva which was able to produce this change of color, with all the reagents save one.

To ascertain what constituents of the saliva might enter into this change of color the following substances were tested with the reagents with results appended:

*These tests have been obtained in slightly acid solution but we do not consider a negative test under such conditions as at all trustworthy.

The reagents used were the tincture of guaiacum, and solution of guaiacum, also pyrogallol, hydroquinon, pyrocatechin: 5 per cent. solution of each in distilled water. The solution of guaiacum is made by dissolving 75 grammes of chloral hydrate in a 100 cc of water, then adding to this enough gum guaiacum taken from the center of a freshly broken piece to make about a one-half per cent. solution.

The solutions to be tested were not made of any particular strength except to be about 1 per cent.

	Sol. Guaiacum	Tinct. Guaiacum	Pyrogallol	Hydroquinon	Pyrocatechin
1 NH_4Cl	2 Sl. Bl4chBl.	4 Gr. Bl.	5 Sl. yel.	5—6—	6—
2 $(\text{NH}_4)_2\text{SO}_4$	5—	4 Gr. Bl.	5 Sl. yel.	5—6—	6—
3 KCys	2 Sl. Bl4chBl.	4 Gr. Bl.	5 Sl. yel.	5—6—	6—
4 KCl	3 ch. Bl.	4 Gr. Bl.	5 Sl. yel.	5—6—	6—
5 KNO_3	4 Sl. Bl.	4 Gr. Bl.	5 Sl. yel.	5—6—	6—
6 Na_2CO_3	3 Gr. Bl. 4Bl.	4 Sl. yel.	2 R. B.	2 Sl. B6ch.RB.	5 Sl. yel.
7 Na_2HPO_4	3 Gr. Bl.	5—	2 B.	2 Sl. B6ch.B.R.	6—
8 NaCl	2 Sl. Bl4chBl.	4 Gr. Bl.	5 Sl. yel.	6 Sl. B.	6—
9 NaNO_3	4 Sl. Bl.	4 Gr. Bl.	5 Sl. yel.	5—6—	6—
10 NaNO_2	1ch. Bl.	2 yel. 5 yel. B.	6 Sl. B.	6 Sl. B.	5 Sl. yel.
11 Albumin (egg)	4 yel. Bl.	4 yel. Bl.	5 Sl. yel.	6 Sl. B.	6—
12 $(\text{NH}_4)_2\text{C}_2\text{O}_4$	5Sl. Gr. Bl.	4 yel. Bl.	2 Sl. yel.	6 Sl. yel.	6—
13 Urea	5—	4 Gr. Bl.	5 Sl. yel.	5—6—	6—
14 Na_2CO_3	5—	4 yel. Bl.	2 R. B.	2 ch. R. B.	2 Sl. B. 5 deepe
15 $\text{Na}_2\text{C}_2\text{O}_4$	5—	5—	5 Sl. yel.	6 Sl. B.	6—
16 Mucin				2 Sl. B. 6ch. R. B.	6—
17 H_2O	5—	5—	5 Sl. yel.	5—6—	6—

1=30 seconds, 2=30 minutes, 3=1 hour, 4=3 hours, 5=6 hours, 6=12 hours, ch.=characteristic, B.=Brown, R. B.=Red Brown, Bl.=Blue, yel.=yellowish, Gr. Bl.=Greenish Blue, Sl.=slight.

It will be seen that pyrocatechin, practically is without action until several hours have elapsed, except a very slight coloration apparently due to minute trace of sodium carbonate. If we assume the assertion of Professor Chittenden to be correct that Na_2CO_3 does not normally occur in the saliva and even under abnormal conditions is extremely slight, this may be disregarded.

From the above results it is reasonable to reject guaiacum

solutions, pyrogallol and hydroquinon as a test for oxydase in saliva. For when can one be certain that other constituents, very minute in quantity, to be sure, but nevertheless exerting their influences, are vitiating the reaction, especially when the rapidity and intensity of the reaction is to be used to estimate the strength of the oxydase present. That there is an oxydase present all these reagents show, but the relative power of the enzyme cannot be truly judged by them.

Two reagents suggesting possibilities but which, on account of the difficulty of procuring, were not used in these tests, are phenolphthaline (reduced phenolphthaline) and the leuco-base of malachite green. The former is recommended by J. H. Kastle and O. M. Shedd in the "American Chemical Journal," No. 26, 1901, and the latter by Wilhelm Adler, "Zeitschrift fur Physiologische Chemie," No. 41, 1904.

Having settled upon a reagent which is reasonably certain as a test for an oxydase, a few experiments were made to determine if possible the origin and also some of the characteristics of the oxydizing enzyme.

In regard to the origin of the oxydizing agent; i. e. The cause of the reaction; four possibilities suggested themselves, 1st: The reaction was produced by a micro-organism existing in the mouth. 2nd: The reaction was the product of the vital activity of micro-organisms. 3rd: The oxydizing agent exists as a hitherto unknown biochemical property of the diastatic enzyme, ptyalin. 4th: The oxydizing agent is a distinct and separate enzyme, the result of the vital activity of the body, presumably of the salivary glands.

To disprove the first of these suppositions: the following tests were made: To a few c. c. of saliva an equal portion of a 1 per cent. solution of phenol was added thus making a total phenol solution of 0.5 per cent.

Another test consisted of adding to saliva more Squibb's ether than it could take up, reagent then added and in fifteen minutes the characteristic reaction was present.

According to Dr. W. D. Miller, American System of Dentistry* in these two cases the micro-organisms would be destroyed or at least greatly inhibited in action, while the ptyalin remains unaffected.

The reagent used in all these tests was a freshly prepared

one per cent. pyrocatechin and upon the addition of this reagent the characteristic reddish brown color appeared in about fifteen minutes.

*Page 794, Volume 1.

A third test was to pass the saliva through a Chamberlain germ proof filter by means of suction, this experiment continuing over two days. Filtered portion tested with reagent and in fifteen minutes a characteristic reaction was present. The unfiltered residue also tested and gave a positive reaction. Incidentally the diastatic action of the filtered saliva was tested by a starch digestive experiment and a positive result occurred showing that ptyalin can be passed through a Chamberlain filter.

Our next experiments were carried on to ascertain if the oxydizing power was contained in the enzyme ptyalin. To determine this a test tube of saliva was placed on a water bath and heated to a temperature of 57°C . for twenty minutes which, according to Dr. W. D. Miller destroys the diastatic action of the ptyalin. At the end of twenty minutes a digestive experiment was made with starch and as there seemed to be some slight action, the saliva was again heated to 57°C . for ten minutes more at the end of which time no diastatic action took place even after thirty minutes. This same saliva was now tested with reagent and in fifteen minutes a characteristic reaction took place. This shows that the oxydizing power does not reside in the ptyalin unless we assume that only the diastatic action of the ptyalin is destroyed at 57°C . which, of course, there is no means of showing. It seems more reasonable, however, to assume that the ptyalin possesses only the property of diastatic action.

With regard to the oxydizing enzyme being the product of the vital activities of the micro-organisms we should expect to find in the saliva collected without paraffin, that is without mastication, the same strength of reaction as in other samples collected with paraffin, since the enzyme should be constantly present in the mouth, being elaborated by the organisms.

In samples of saliva collected without paraffin and tested with reagent, in thirty minutes only a slight color was discernable and not until after forty-five minutes could it be said that the reaction was characteristic.

Salivas from the same sources but collected with paraffin gave a characteristic color reaction in fifteen minutes. We know

that saliva as it comes from the glands is uncontaminated with micro-organisms therefore the enzyme is not the result of the vital activity of the micro-organisms.

Hence, by a process of elimination the conclusion is reached that we are dealing with a separate and distinct oxydizing enzyme.

Oxydizing enzymes have been divided into two classes known as the ozydases and the peroxydases. The ozydases are those enzymes which by their own independant activity produce chemical changes indicative of the utilization of oxygen. The peroxydases, on the other hand, are those enzymes which act as intermediaries between a supply of oxygen and the substance to be oxydized, that is they do not elaborate their own oxygen but simply carry it from one combination to another, as from air to substance.

To determine whether the oxydizing enzyme we are dealing with is an oxydase or a peroxydase tests were made in an atmosphere free from oxygen (CO_2) with positive results in each case. These tests do not exclude the possibility of air being in the watery medium since it was impossible to boil, as this destroyed the enzyme.

Another test made under the receiver of an air pump and in fifteen minutes characteristic reaction had taken place. In this test as in the preceeding the same possibility of dissolved oxygen is present but this as well as the possibility of a somewhat imperfect vacuum can be passed by, since no difference whatever could be distinguished in the rapidity nor appearance of the reaction.

From these tests we assume that an oxydase is present. When making a test for oxydase in a tube of saliva it is noticeable that the strongest color always appears at the surface of the liquid, thus indicating a peroxydase, that is transferring the oxygen from the air to the reagent. Thus, in naming this enzyme we can borrow a bacteriological term and call it a facultative oxydizing enzyme. At any rate it is probable that while the enzyme has the power of doing its own oxydizing, it will also utilize free oxygen whenever opportunity offers.

A few tests were also made as to the amount of heat the enzyme would stand and it was found that ten minutes at 70°c . or 75°c . did not destroy its power: that two minutes at 80°c . or 85°c . did not impair its reaction, but two minutes at 90°c .

greatly impaired its reaction so that at the end of thirty minutes only a very slight pink color was present. Carried to a temperature of 100° c. in a water bath its reaction was destroyed.

Lactic acid when added in sufficient strength to cause an acid reaction of litmus paper, greatly retards the action of the oxydase.

The oxydase does not dialyze through parchment, but can be evaporated to dryness in a vacuum at 48° c. without destroying its oxydizing property.

The oxydase in a sample of saliva gradually deteriorates but this process is variable; one sample from a healthy person being kept for over three weeks with but slight loss of power, while a number of salivas from hospital patients, after five days, were greatly reduced in power.

CONCLUSIONS.

We may briefly summarize this work as follows:

First. That human mixed saliva contains an oxydizing enzyme distinct from ptyalin.

Second. That the enzyme exhibits the properties of both an oxydase and a peroxydase.

Third. That it is a product of the body (probably glandular) metabolism and may be increased in quantity, or activity by mastication.

Fourth. That it is more resistant to heat than ptyalin but more easily destroyed by acids.

Fifth. That the color obtained with a freshly prepared 1 per cent. solution of pyrocatechin is sufficient test for this enzyme in saliva.

C. FRANKLIN MACDONALD, JR.
and H. CARLTON SMITH.

THE NEW YORK INSTITUTE OF STOMATOLOGY.

Your Committee on Research begs leave to report as follows :

It has nothing new or tangible to offer but it has not been idle. In truth, it has been thinking and working a great deal and hopes it has prepared the way for something of great value in the end.

Your committee has taken for consideration the subject most vital to the interests of the profession and to humanity in general, viz: the prevention of caries and consequent loss of the teeth, by starting a movement to discover, if possible, the secondary causes of caries, those that contribute directly or indirectly to caries by affecting the environment or by furthering or hindering the vital activities of the germs that do the destructive work. Your committee feels certain that the story of tooth destruction has been less than half told, that the part untold may hold the key to the whole problem.

When in 1891, Dr. Miller published the results of his investigations and study in his epoch-marking work, "The Micro-organisms of the Human Mouth, the Local and General Diseases Caused by Them," the dental world accepted his conclusions without question. It was evident that they were based on facts obtained by long and carefully conducted experiments, that they were fully demonstrated and tested in every way. It was seen that the day for theories and opinions had passed and that of exact science had taken its place. Dr. Miller stated that caries of the teeth was caused by, first: the growth and multiplication of germs peculiar to the mouth, whose habitat was the cracks, crevices and occluding surfaces of the teeth, and second: that these germs, as a result of their life activities and as a by product of their growth, threw out lactic acid; third: that the lactic acid in its nascent and most powerful state attacks and breaks up the lime salts of the enamel, forming with them stronger but soluble combinations, which are lost in the oral cavity and, fourth: that later on other germs act on the dentine by a digestive process and destroy its integrity.

The acceptance of Dr. Miller's investigations and of his conclusions therefrom, was prompt and general. It was felt that at last the profession had solid ground to stand on in combating the great enemy of the human mouth. Following the new light there was a pronounced movement on the part of the profession toward

the conservation of the teeth by preventive measures, either by inhibiting the growth of the germs or by their immediate destruction. It was felt that the dawn of tooth salvation was at hand. Knowing the cause of teeth caries, the proper remedies seemed evident and great was the rejoicing. The enemy was corralled, was classified and even photographed. What more could one ask?

A little later another step in advance was taken by the discovery by Dr. Williams of his so-called gelatinous plaques. They seemed to show how caries had its inception. Still later Dr. Black followed with his demonstration of the constancy in the structure of the teeth. The dental world was happy and the age of germicides and antiseptics was fairly and fully launched. The necessity for greater cleanliness was advocated. The axiom that "a clean tooth never decays" became a watchword. To this day this holds good. Time went on and the air was filled with new methods of technique and new germ destroyers having all sorts of Greek and Latin names attached to attract attention. A new school of dentistry was inaugurated which demanded a longer and enlarged course of study and preparation. The practice of dentistry became more exact and greater skill and knowledge were required. A real advance movement was started, but gradually it was found that results were not up to expectations. Teeth continued to decay and be lost. The ravages of the enemy were held in abeyance but not prevented. Furthermore, the increased cost for dental services was so great that only the few could reap any benefit therefrom, but thought could not be stifled or kept in abeyance. Certain old facts attained new significance and demanded attention. It was only too certain that all was not known. New chapters must be added to those already written. The question, "What is it that makes for decay in one mouth and does not in another?" came to the front and "Why are the teeth in one mouth subject to such great variation in rapidity of decay at different periods, while all other apparent conditions remain unchanged," was even more puzzling. Variations in the general condition of the patient's health certainly could not account for these apparent anomalies, for it is common enough to find otherwise healthy people with badly decayed teeth and unhealthy people having strong, healthy teeth. Dentists commenced to ask more and more insistently this question: "What is this some-

thing or lack of something that causes tooth-destruction in one mouth and does not in another, or that changes conditions so radically in the same mouth at different periods of life?" It is doubtful if more than one per cent. of the so-called civilized people of the world have anything like proper attention given to the preservation of their teeth. It would take dentists by the hundred where we now have units to serve the masses properly. Must they go without this service? Is not the discovery of this unknown factor a matter of vital importance to them? The demand is for an anti-carries specific, an anti-toxin or something that will arrest decay or prevent it. The solution of the problem lies in the discovery of this unknown factor of decay. If this were known the problem could be attacked scientifically and with a fair chance of success. Preventive medicines is the crying demand of the day. Every dentist is asked the question: "What can I do to save my teeth?" the wholly inadequate reply, as before mentioned, has been and is: "Keep your teeth clean."

Your Committee on Research has made the situation a subject of much thought and now places its conclusions before you, asking you to consider them carefully and vote accordingly.

From what has been said, you will see that no subject more important and more vital to the profession and to the public could be considered. We ask you to put in our hands the money wherewith to commence the work of research and investigation, to begin and press to a conclusion, an earnest and combined effort to find this unknown factor or factors in tooth destruction. The Institute may be condemned to long and weary waiting for practical results. We are well aware of the nature of the task we would undertake. We know that we must have the use of trained educated workers as well as that of a fully equipped modern laboratory and abundant hospital material at command, and, above all, as director, a man who would take a living interest in the work he undertakes.

We think that in Dr. Gies we have found the man, and in the laboratory and hospital of the "College of Physicians and Surgeons" the other requirements. The Laboratory of Nutrition in Boston, one of the offshoots of the Carnegie Institute, has referred us to the man we were looking for. Our Chairman, Dr. Howe, after several meetings and consultations with Dr. Gies,

brought the matter before your Board of Directors. The Board, after listening to Dr. Gies, thought so well of the project, that they voted unanimously to accept Dr. Gies' offer and will so report.

Dr. Gies has from the first entered heartily into our plans and ambitions.

Your committee has, as briefly as possible, placed the matter before you. Much, very much, remains unsaid. The cost in time and money is great, but the prize to be won is worth all and more than the cost. Even if we do not win out now, we are sure of paying results, especially in that the whole subject will be pushed into the light of investigation and discussion. We are ready to commence the work and hope to do so without delay. The final decision rests with you.

G. S. ALLEN,
A. H. MERRITT,
J. MORGAN HOWE.

The New York Institute of Stomatology is pleased to announce that William J. Gies, M.S., Ph.D., Professor of Biological Chemistry in Columbia University, has consented to direct a scientific study of saliva, its constituents and variations, with a view to determine the relations of that fluid to dental diseases. To that end Dr. Alfred P. Lothrop, one of Prof. Gies' assistants, will devote his time to the work, and the members of the Institute, and all other dentists and physicians who are interested are invited to co-operate, by obtaining specimens of saliva from patients who are either immune to dental disease, or who exhibit extremely bad dental conditions, such as active and rapid decay, progressive erosion, constant precipitation of salts causing tartar, and pyorrhea alveolaris. Each specimen of saliva is to be accompanied by a careful statement of the clinical observations of the conditions appearing in and about the teeth. These specimens with the clinical records will be collected in Manhattan Borough, on notice being given to Prof. Gies, 437 West 59th Street, by telephone or otherwise, and will be carefully examined in the laboratory of the College of Physicians and Surgeons. Those outside of Manhattan are requested to send specimens and records to the Laboratory. Arrangements have been made for this research work to continue at least until the end of the present

academic year, and it is greatly desired that a large number of dentists assist as above indicated. All who will do so are invited to send their names and addresses to one of the members of the Research Committee of this Institute; they will then be supplied with bottles for holding specimens and a sheet of directions from Prof. Gies.

GEO. S. ALLEN, 51 W. 37th St.,
ARTHUR H. MERRITT, 59 W. 46th St.,
J. MORGAN HOWE, 12 W. 46th St.,
Chairman Committee.

Prof. Gies' Telephone: Columbus, 1957.

New York, December, 1909.

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Journal of the Allied Dental
Societies V. 4 1909
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